AIRCRAFT COLLISION AVOIDANCE AND AIR TRAFFIC SAFETY

HEARING

BEFORE THE

SUBCOMMITTEE ON TRANSPORTATION, AVIATION AND MATERIALS

OF THE

COMMITTEE ON SCIENCE AND TECHNOLOGY U.S. HOUSE OF REPRESENTATIVES

NINETY-SEVENTH CONGRESS

FIRST SESSION

SEPTEMBER 2, 1981

[No. 52]

Printed for the use of the
Committee on Science and Technology

U.S. GOVERNMENT PRINTING OFFICE
88-845 O WASHINGTON : 1982

H701-22

COMMITTEE ON SCIENCE AND TECHNOLOGY

DON FUQUA, Florida, *Chairman*

ROBERT A. ROE, New Jersey
GEORGE E. BROWN, JR., California
JAMES H. SCHEUER, New York
RICHARD L. OTTINGER, New York
TOM HARKIN, Iowa
MARILYN LLOYD BOUQUARD, Tennessee
JAMES J. BLANCHARD, Michigan
TIMOTHY E. WIRTH, Colorado[1]
DOUG WALGREN, Pennsylvania
RONNIE G. FLIPPO, Alabama
DAN GLICKMAN, Kansas
ALBERT GORE, JR., Tennessee
ROBERT A. YOUNG, Missouri
RICHARD C. WHITE, Texas
HAROLD L. VOLKMER, Missouri
HOWARD WOLPE, Michigan
BILL NELSON, Florida
BERYL ANTHONY, JR., Arkansas[1]
STANLEY N. LUNDINE, New York
ALLEN E. ERTEL, Pennsylvania
BOB SHAMANSKY, Ohio
RALPH M. HALL, Texas
DAVE McCURDY, Oklahoma
MERVYN M. DYMALLY, California

LARRY WINN, JR., Kansas
BARRY M. GOLDWATER, JR., California
HAMILTON FISH, JR., New York
MANUEL LUJAN, JR., New Mexico
HAROLD C. HOLLENBECK, New Jersey
ROBERT S. WALKER, Pennsylvania
EDWIN B. FORSYTHE, New Jersey
WILLIAM CARNEY, New York
MARGARET M. HECKLER, Massachusetts
F. JAMES SENSENBRENNER, JR., Wisconsin
VIN WEBER, Minnesota
JUDD GREGG, New Hampshire
RAYMOND J. McGRATH, New York
JOE SKEEN, New Mexico
CLAUDINE SCHNEIDER, Rhode Island
JIM DUNN, Michigan
BILL LOWERY, California

HAROLD P. HANSON, *Executive Director*
PHILIP B. YEAGER, *General Counsel*
REGINA A. DAVIS, *Administrator*
GERALD E. JENKS, *Minority Staff Director*

SUBCOMMITTEE ON TRANSPORTATION, AVIATION AND MATERIALS

DAN GLICKMAN, Kansas, *Chairman*

RALPH M. HALL, Texas
TOM HARKIN, Iowa
BOB SHAMANSKY, Ohio
MERVYN M. DYMALLY, California
RONNIE G. FLIPPO, Alabama

BARRY M. GOLDWATER, JR., California
JIM DUNN, Michigan
HAROLD C. HOLLENBECK, New Jersey
WILLIAM CARNEY, New York

[1] On assignment to Budget Committee for 97th Congress.

CONTENTS

WITNESSES

September 2, 1981:	Page
Michael J. Fenello, Deputy Administrator, FAA; Al Albrecht, Associate Administrator for Engineering and Development, FAA; Bob Smith, Chief, Air Traffic Division, Western Region, FAA, accompanied by Martin Pozesky, Deputy Director, Systems Research and Development Service, FAA; Jack Ryan, Acting Chief, Operations Division, Air Traffic Service, FAA	7
William T. Hardaker, Assistant Vice President, Air Navigation and Traffic Control, Air Transport Association, accompanied by George Carver, Deputy Director, Los Angeles regional office; and Joseph C. Snodgrass, Director of Aviation Programs, Aerospace Industries of America, Inc	23
Jack Howell, Executive Central Air Safety Chairman, Air Line Pilots Association; Capt. H. Ray Lahr, Los Angeles area Safety Coordinator; and Robert Warner, Vice President, ATC, Airports, and Airspace, Aircraft Owners & Pilots Association	33
Domenic Torchia, Vice President, western region, Professional Air Traffic Controllers Organization	49

AIRCRAFT COLLISION AVOIDANCE AND AIR TRAFFIC SAFETY

WEDNESDAY, SEPTEMBER 2, 1981

HOUSE OF REPRESENTATIVES, COMMITTEE ON SCIENCE AND TECHNOLOGY, SUBCOMMITTEE ON TRANSPORTATION, AVIATION AND MATERIALS,

Washington, D.C.

The subcommittee met, pursuant to call, at 9:30 a.m., in Van Nuys Airport meeting room, 6950 Hayvenhurst, room 109, Van Nuys, Calif., Hon. Dan Glickman (chairman of the subcommittee) presiding.

Present: Representatives Glickman, Goldwater, and Dunn.

Mr. GLICKMAN. The hearing will come to order.

It is a pleasure to be in the Los Angeles area for what I hope is the conclusion of at least this subcommittee's immediate concern with collision avoidance systems.

For the benefit of the audience I thought I might talk briefly about this subcommittee. We are a subcommittee of the House Science and Technology Committee, and we have jurisdiction over research, involving both FAA and NASA. Over the last several years, largely through the efforts of my colleague from California, Barry Goldwater, this subcommittee has taken a lead role in pushing the FAA to make some decisions on a variety of issues. For example, the subcommittee has been pushing for the development and implementation of a collision avoidance system so airplanes won't crash into each other. Such a system would provide a warning to a pilot so that a midair collision could be prevented.

The FAA, although it has gone through a number of proposals, has come up with a proposal called TCAS which, hopefully, will be the latest state of the art and the last word on trying to come up with a system so that we don't have any more problems like the tragic San Diego accident. With TCAS, I understand there will be an effort to try to give the pilot more information in the air so we don't have midair collisions. This basin is perhaps the most heavily traveled area for aircraft in the world and it is appropriate that we have this final hearing here.

The other area the subcommittee will pursue concerns the air traffic control en route computer system, the system that moves aircraft from place to place throughout the country. Again this is an area where this subcommittee has taken the lead role in pushing the FAA and the Office of Management and Budget to come up with a computer replacement program so that the air traffic control system can be modernized.

I would ask that my entire statement appear in the record.

[The opening statement of Hon. Dan Glickman follows:]

OPENING STATEMENT
HONORABLE DAN GLICKMAN
LOS ANGELES, CALIF.
SEPTEMBER 2, 1981

TODAY, THE HOUSE SCIENCE AND TECHNOLOGY SUBCOMMITTEE ON TRANSPORTATION, AVIATION, AND MATERIALS WILL FOCUS ON AIR SAFETY IN THE LOS ANGELES BASIN. ALSO, AS PART OF THIS, WE WILL LOOK AT THE FAA'S NEW CONCEPT FOR AVOIDING MID-AIR COLLISIONS -- THE SO-CALLED TCAS OR THREAT ALERT AND COLLISION AVOIDANCE SYSTEM.

AS THE SUBCOMMITTEE WITH LEGISLATIVE JURISDICTION OVER THE DEVELOPMENT OF COLLISION AVOIDANCE SYSTEMS, WE HAVE BEEN INVOLVED IN THIS ISSUE FOR YEARS. LAST SPRING, WE HELD EXTENSIVE HEARINGS ON THIS IMPORTANT SUBJECT. AT THAT TIME, WE MADE A SPECIAL EFFORT TO HEAR ALL POINTS OF VIEW ON THE FAA'S COLLISION AVOIDANCE PROGRAM, AND WE CONSIDERED MANY CHARGES AND COUNTER-CHARGES FROM A VARIETY OF WITNESSES.

DURING THOSE HEARINGS, FAA ADMINISTRATOR HELMS ASSURED US THAT HE WOULD TAKE A COMPREHENSIVE AND IN-DEPTH REVIEW OF

THE FAA'S COLLISION AVOIDANCE PROGRAM.

SUBSEQUENTLY, HE ANNOUNCED THAT THE FAA WOULD TAKE A NEW APPROACH TO PROVIDING PROTECTION AGAINST MID-AIR COLLISIONS. TODAY, WE ARE GOING TO TAKE A LOOK AT THIS NEW CONCEPT, WHICH HE HAS NAMED "TCAS."

THE PUBLIC HAS A RIGHT TO EXPECT THE SAFEST POSSIBLE AIR TRANSPORTATION SYSTEM. THEY ALSO HAVE A RIGHT TO EXPECT THAT WE CONDUCT A THOROUGH REVIEW OF THE TECHNICAL AND POLICY ASPECTS OF THIS IMPORTANT ISSUE, AND THAT IS WHAT THE SUBCOMMITTEE WILL ATTEMPT TO DO IN THIS HEARING.

IT IS APPROPRIATE THAT WE ARE HOLDING THIS HEARING TODAY IN THE LOS ANGELES BASIN, THE DENSEST OF ALL TRAFFIC AREAS IN THE UNITED STATES. I'M GLAD WE ARE ABLE TO HOLD THIS KIND OF HEARING AWAY FROM WASHINGTON SO THAT PEOPLE WHO DO NOT NORMALLY COME THERE, BUT WHO ARE VITALLY EFFECTED, CAN PARTICIPATE. AND I'M PARTICULARLY GLAD TO BE HERE TODAY WITH MY COLLEAGUE, MR. GOLDWATER, THE RANKING MINORITY MEMBER OF THE SUBCOMMITTEE. HIS EXPERIENCE AND EXPERTISE IN AVIATION HAS BEEN MOST HELPFUL TO THE COMMITTEE AND TO CONGRESS OVER MANY YEARS. I WISH TO WELCOME ALL OF OUR WITNESSES TODAY AND TO SAY THAT I LOOK FORWARD TO AN INFORMATIVE AND PRODUCTIVE HEARING.

Mr. GLICKMAN. I would like to say we are fortunate on this committee. We are one of the few committees in Congress to have a variety of degrees of expertise. My expertise is probably less than my colleague's here.

I come from Wichita, Kans. We produce most of the airplanes you saw at the Van Nuys Airport as you came to the hearing today. At least we produce a lot of them. Roughly 65 percent of all general aviation aircraft in the world are made in my hometown. So I have an interest in seeing that these airplanes are flown and flown safely.

Congressman Goldwater is the ranking minority member of this subcommittee and also serves on the Aviation Subcommittee of the Public Works Committee, so he probably has more expertise on aviation—in fact, I think he is the only member serving on both aviation committees—than any other Member of the House. It is largely through his leadership that FAA has moved ahead on the collision avoidance system.

Congressman Dunn from Michigan is a freshman this year, although you would not know it from watching him in the House. He is an active pilot and one of the few Members of the House that flies his own plane to and from his home in Michigan. So we have people who know something about the subject matter.

Now I would like to turn to Mr. Goldwater, the ranking minority member.

Mr. GOLDWATER. Thank you, Dan.

It is proper that we are holding these hearings in the Los Angeles metropolitan area. In 1980, 10 percent of all takeoffs and landings in the United States took place in southern California. Los Angeles is probably one of the most heavily congested areas in the world for general and commercial aviation activities. It is important that whatever air traffic systems we design, whether they are technical or procedural in nature, that they be able to handle the most densely populated areas such as Los Angeles.

I have been following collision avoidance activities in the United States for all the 12 years I have been in Congress. I have become increasingly frustrated because time and time again we embark upon a new system and then we scrap that one and go to another. I remember it all started with ACAS. There were three of them, called EROS, SECANT, and AVOIDS. There was also a ground-based system called intermittent positive control, or IPC.

I was talking earlier with Bill Hardaker, who will be testifying for ATA later on. He reminded me that in 1971 I took a ride in an airplane that had a collision avoidance system called EROS. It was developed by McDonnell Douglas, and it worked well back in 1971. And there were other contenders in those days. RCA and Honeywell were involved.

As ACAS was getting close to implementation in 1976, FAA found something better called BCAS—so they dropped ACAS. In September of 1978, the San Diego collision took 144 lives. FAA split BCAS into active BCAS and Full BCAS. And they changed the name of IPC to ATARS.

In the summer of 1979, and again in the spring of this year, our subcommittee held hearings on these systems. FAA pronounced

them healthy and near operational. But by June, they found something better called TCAS, so BCAS went down the tubes.

In August, PATCO went on strike, and questions have been raised about safety. But after 12 years—at least the 12 years that I saw—there is still no operational CAS, except EYE-CAS. And that is spelled E-Y-E. That will probably always be the best system.

I'm afraid that when TCAS is ready in 3 or 4 years, a new FAA administrator will say, "Hey, there's something better just down the road," and dump TCAS for the new system. So we may never get a CAS, because there will always be some new technology just down the road. Perhaps it is time for Congress to step in and say, "This is good enough. Let's go with it."

On the other hand, perhaps there is another way of looking at what FAA did as being evolutionary. They studied ACAS, and learned some things but found some problems. They solved those problems by switching to BCAS, while keeping the good parts of ACAS. Then BCAS had limitations, so they fixed them with TCAS, while keeping the good parts of BCAS.

I agree with FAA that TCAS is better than BCAS. I just don't know if it is worth the extra 2- or 3-year wait. I would rather be a pilot or passenger on a plane equipped with TCAS rather than BCAS. But given the choice between BCAS or nothing for 2 years, I would obviously take BCAS. And I think the American flying public would, too.

So, I want to look at both sides of this issue fairly. Maybe FAA is right. Maybe they are wrong. Or maybe there is a middle ground: we could implement BCAS as soon as possible while waiting for TCAS to be developed. Perhaps the BCAS could then be upgraded to TCAS at a reasonable cost.

Now, I want to shift to another subject, and that is air traffic control here in the Los Angeles area. As I said earlier, in 1980, 10 percent of all flights in the United States took off or landed in southern California. That alone is enough to make this area a problem for air safety. But the problem is compounded by typically poor visibility, high mountains, and severe noise constraints. I am afraid that the system we have built up over the years here is in some ways an accident waiting to happen. At this hearing I want to explore ways to make things safer.

President Reagan says we are rebuilding the ATC system now. I don't want to rebuild it just as it was. I want to build a safer and more efficient system than we ever had.

So, ladies and gentlemen, I want to compliment the chairman, Dan Glickman, who has been very helpful over the past several years in matters involving aviation safety. I have been on the committee for 12 years, and he is one of the finest chairmen we have had. We have had a good relationship with the FAA and with NASA and other agencies that deal with aviation matters.

I particularly appreciate the appearance today of Mr. Albrecht and Mr. Pozesky, who have long worked on these subjects and have worked very well with the Congress in trying to arrive at a consensus.

I am pleased that Jim Dunn from Michigan would come out to sunny California and make his contribution because he has inti-

88-545 O—82——2

mate knowledge of aviation. He is a pilot himself, and is very interested in aviation matters involving the Congress.

I am deeply concerned that the FAA is not doing enough in southern California to recognize this "accident waiting to happen" and in pursuing the potential problem that could very well erupt in the near future. I think we need an aggressive attack by FAA to find out more about the patterns of flight in and around the Los Angeles basin and to come up with a program that will minimize the potential accidents that could happen.

FAA came up recently with a freeway in the sky system, a recommendation to pilots. I think that is a step in the right direction. But it may not be enough. It may be there are other requirements that we should be looking at. But I would like to see FAA reviewing this southern California area more and inviting the public and the pilots to participate. Hopefully, they will come up with a final solution as to how we can handle future traffic densities forecast for the Los Angeles basin.

Mr. Chairman, I thank you and I look forward to the testimony of our excellent witnesses.

Mr. GLICKMAN. Mr. Dunn.

Mr. DUNN. The two issues the chairman talked about were the collision avoidance system and the general modernization of the computers. This committee felt strongly that FAA, on both issues, has been dragging their heels. As a result, we have introduced legislation in the House, for your information, that says FAA has until December 31 to deliver to the Congress a definite plan for a new computer system. We are dealing today with traffic safety on computers that average 16 years old with an original life span of 9 years. This committee intends to fight for passage of that resolution when we go back next week.

Hopefully, we do not have to do the same kind of thing on collision avoidance. Hopefully, FAA, who will be testifying today, will be able on their own, without this pressure from Congress, to implement a similar type plan.

Mr. GLICKMAN. It is a pleasure to welcome the representatives from FAA, particularly Michael Fenello, Deputy Administrator of FAA, who was drawn out of retirement from Eastern Airlines into what he may have anticipated would be a reasonably quiet job, but has turned out to be as taxing as anything he had with the airlines.

It is a pleasure to have you all here to testify. You may proceed as you wish. I know you want to demonstrate the TCAS system after you testify, before questions, so we can have an opportunity to look at it.

Go ahead.

STATEMENTS OF MICHAEL J. FENELLO, DEPUTY ADMINISTRATOR, FAA; AL ALBRECHT, ASSOCIATE ADMINISTRATOR FOR ENGINEERING AND DEVELOPMENT, FAA; BOB SMITH, CHIEF, AIR TRAFFIC DIVISION, WESTERN REGION, FAA, ACCOMPANIED BY MARTIN POZESKY, DEPUTY DIRECTOR, SYSTEMS RESEARCH AND DEVELOPMENT SERVICE, FAA; JACK RYAN, ACTING CHIEF, OPERATIONS DIVISION, AIR TRAFFIC SERVICE, FAA

Mr. FENELLO. Speaking for Administrator Helms and FAA, we welcome the opportunity to be here to present our views on collision avoidance systems and air traffic control safety in the Los Angeles area. Already introduced, and on the list, are Al Albrecht, Associate Administrator for Engineering and Development; and Marty Pozesky, Deputy Director of the Systems Research and Development Service. Not introduced and with me today are Jack Ryan, Acting Chief of the Operations Division in the Air Traffic Service, and Bob Smith, Chief of the Air Traffic Control Division in the western region, to discuss the air traffic system in the Los Angeles basin.

Mr. Chairman, I believe a very brief summary of FAA's continuing efforts to improve the safety and efficiency of the services it provides would serve as a meaningful background for the rather technical and specific presentations Al and Bob will be making. The Administrator has placed a very high priority on the formulation of a plan to upgrade and modernize the air traffic control system. His analysis of the current and future aviation environment quickly led him to conclude that within the next 10 years we would be doubling the aircraft fleet using the Nation's airspace, no doubt applicable to Los Angeles basin.

Accordingly, a national airspace review is already underway as well as a thorough review of automation opportunities—the systems software and hardware requirements of the future air traffic control system. The detailed review that led to the decision on TCAS was the first step in a plan that will encompass all the FAA's major acquisition needs and programs.

We have begun and are continuing detailed technical reviews, usually 3 hours a day and at least 3 days a week. The topics include collision avoidance, DABS/data link/automatic traffic advisories and resolution [ATARS], microwave landing systems, weather, communications, navigation, automated en route air traffic control [AERA], en route and terminal automation, primary radar requirements—all of these and more are being reviewed. We delve into the requirements, the ongoing program, and the alternatives. Each element or building block, if you will, that will lead to the describing and sizing of the advanced automated system required to handle the demand is being carefully examined and decisions are being made. We have not yet completed the process and there have been a few diversions, but we are on schedule and are confident the overall plan will be completed before the end of the year. We are also confident that the plan will provide for a safe and efficient system designed to be implemented and operated in an economical manner and fully capable of providing the necessary services with no undue regulatory burden.

Mr. Chairman, as you are aware, recent events have added another dimension to the reviews of our programs to upgrade and modernize the air traffic control system. That dimension has both near- and long-term planning implications. You may be assured that we are working diligently to provide to the aviation community as much service as possible in the near term without compromising safety. Our longer term plans will also continue to be based upon safety first, with efficiency and productivity closely following in priority. I could say, because it is a fact, that safety is first, second, third, and fourth in priority—followed by efficiency and productivity.

Mr. Chairman, at the end of our presentation we will, of course, be pleased to respond to questions you and other members of the subcommittee may have on these and other topics. At this time, however, I would like to continue our presentation by calling upon Mr. Albrecht to discuss the FAA's decision to develop TCAS.

Mr. ALBRECHT. Mr. Chairman, members of the subcommittee, it is a pleasure to be with you this morning here at Van Nuys Airport to discuss the FAA's program for collision avoidance systems.

As you know, on June 23, 1981, Administrator Helms announced his decision to proceed with the implementation of an airborne collision avoidance system. The system he decided upon is called the traffic alert and collision avoidance system [TCAS]. It builds directly on all the previous work done in this area and specifically on development efforts relating to the beacon collision avoidance system [BCAS].

The strategy associated with the approach is based upon the foundation of, first, providing a collision avoidance capability which is totally independent of the ground and can reliably operate in all high density traffic predicted for the year 2000; second, providing a program strategy which insures the earliest system availability consistent with ATC system needs and will allow industry to begin manufacturing and marketing these devices as early as possible; third, insuring a system design which is compatible with the plans for evolution and upgrading of the ATC system.

The Administrator is firmly committed to this program, and we are confident that our goals of providing early and complete collision avoidance protection can be achieved.

There will be two levels of traffic alert and collision avoidance capability called TCAS I and TCAS II. Other levels of capability built around these two basic systems are possible, and I will refer to these as TCAS I enhancements, or TCAS II enhancements.

The basic TCAS I is directed at providing a low-cost capability to the general aviation user. TCAS I is essentially a mode S ATC transponder, a proximity alerter, and a crosslink for communications with the more complete TCAS II. Mode S is the international, or ICAO, name for the discrete address beacon system, or DABS. TCAS I provides features applicable to the general aviation user. It contains a standard ATC transponder with built-in Mode S surveillance and data link capability. It includes an encoding altimeter.

TCAS I provides a simple audio and visual alert to the proximity of an aircraft equipped with a transponder or with a TCAS. In its basic form, a simple "presence" light is envisioned but more sophis-

ticated versions can offer additional levels of capability—TCAS I to TCAS I service will be provided in all airspace.

TCAS I also includes an air-to-air data link capability, or cross-link, between itself and TCAS II equipped aircraft. This link will be used by the TCAS II system to transmit to TCAS I data about the TCAS II position and maneuver intent for TCAS I/TCAS II conflicts.

Several enhancements are envisioned for the basic TCAS I. These include the use of an onboard airborne directional antenna through which the "direction of threat" or "o'clock position" information can be provided to the pilot. Enhancements may also include an air-to-air ranging capability so that the TCAS I equipped aircraft can obtain the exact distance—range—to the proximate aircraft. Our basic intent is to encourage industry to innovate in this direction, but we are also careful to note that certain constraints will have to be applied, such as allowable interrogation rate, to prevent interference with the ground surveillance system.

Our schedule for TCAS I is very near term—in fact, we are not planning additional development work for this system. Based upon the fact that we have received the necessary frequency clearance for the use of the mode S system, we expect to issue general guidance to industry for TCAS I design and associated data link formats by April 1982. From that point on, we are confident that industry will begin to manufacture TCAS I systems for sale to the community.

Let me talk now to the TCAS II design, which is essentially targeted for the air carrier community. TCAS II is a totally active system which will provide high quality protection in the dense environments predicted for the future. You may recall that earlier studies had indicated that it would not be possible to provide this complete protection solely with an active mode. However, recent work under the full BCAS program, coupled with recently developed airborne antenna techniques, has led to the realization that this capability can be provided. The addition of directional antennas coupled with a technique called adaptive interrogation—to eliminate interference with the ground system—will allow the TCAS system to operate in the high-density airspace predicted for the future without the need for ground dependency. Accordingly, we have stopped the additional work on the passive modes which we were pursuing on our full BCAS program.

In addition to the capacity improvement obtained through use of the directional antenna for TCAS II, this same technique can be used to provide a proximity warning indication (PWI) or bearing capability if the operators so choose. This capability will certainly be good enough to support an o'clock bearing position for PWI and may prove to be considerably better.

The basic TCAS II will provide vertical avoidance maneuvers. We are hopeful that later enhancements will allow a horizontal maneuver capability, but we must complete additional development work before this can be assured.

As you requested, I would now like to talk briefly about the differences between our TCAS II design and the earlier active BCAS program. First, TCAS II is an upgraded version of the earlier

active beacon collision avoidance system to which airborne directional antennas and a crosslink have been added.

The addition of the airborne directional antenna plus the "adaptive interrogation" techniques will allow us to avoid interference with the ground. The "o'clock" PWI capability is another built-in improvement over the omni-directional active BCAS.

The remaining development efforts are focused on an improved directional reception airborne antenna design for TCAS II. The other portions of the system are well understood and have been extensively tested as part of the ongoing collision avoidance test program. We are currently in the process of contracting with industry to provide this directional antenna and crosslink capability which will be added to the design for the active BCAS.

We expect that we can complete the design and testing of TCAS I in 18–21 months and expect full production and installation to be underway in 36–48 months. We will make all of our design information available to industry as part of the process and encourage manufacturers to move out on their own.

In response to questions concerning the role of omni-directional CAS systems in the near term, the FAA, in order to provide earliest possible collision protection, will consider approving collision avoidance systems without directional interrogation or receiving capability during an interim period, if the applicant demonstrates provisions for upgrading system performance to the minimum TCAS II capabilities. For such systems the crosslink capability need not include transmission of relative azimuth.

Mr. Chairman, that concludes my prepared remarks. I understand you plan to ask questions. Before answering your questions about TCAS, we believe it would be helpful if the committee members would examine a TCAS demonstration which has been provided. With your permission Marty Pozesky will describe this.

Mr. POZESKY. We brought with us a demonstration of some equipment that has been built for us by the Dalmo-Victor Corp. It is a direct derivative of our BCAS program. And as Mr. Goldwater accurately pointed out, TCAS II is an evolutionary step from the active BCAS program, a much improved step. We are in the process of taking that step in our hardware design. We have taken the equipment Dalmo has built under contract to FAA and are in the process of upgrading it. We have a demonstration which is very, very akin to what a pilot might see with the full TCAS II equipment.

With your permission, if the committee would like, it will take 5 to 10 minutes, and we can provide that demonstration.

[Recess.]

Mr. GLICKMAN. Where do we stand in terms of the administration's regulatory authority to push this system? Has a decision been made? Have we published it in the Federal Register on the TCAS I or TCAS II?

When does the general aviation and commercial aviation community know it is ready to go? Where are you?

Mr. ALBRECHT. I will let Marty run down the dates in terms of the Administrator's position. He is very firm in terms of our doing everything we can to provide early availability of both.

The TCAS I and TCAS II, that is a commitment and there is no equivocation on the decision to proceed in this direction. He is firm with that. In terms of his regulatory position he said he prefers not to mandate, not to tell people what to do, but to make the equipment and the systems so attractive they will voluntarily do so. If it works out that way we have no issue. If it does not it is his determination.

Mr. GLICKMAN. When you say you prefer not to mandate it, what will you do then? Will you publish some sort of standard?

Mr. ALBRECHT. We will publish characteristics of TCAS I and TCAS II. RTCA is now looking at TCAS and modifying their terms of reference for the BCAS minimum operational performance specifications.

That is the first step, to provide information to industry on what is acceptable that can be installed on aircraft. We have provided minimum TCAS I and TCAS II specifications, what they have to do.

We also provided guidance on enhancements we hope industry will work on.

Mr. GLICKMAN. What I am saying is are you mandating it for the terminal control area? Are you mandating the use of collision avoidance systems anywhere?

Mr. ALBRECHT. Not at this point.

Mr. GLICKMAN. What incentive is there to pick up the cost and put one on?

Mr. ALBRECHT. In terms of TCAS I we are providing this cross link and data link capability so many services can be piped from the ground to general aviation aircraft TCAS I. The cost of TCAS I is expected to be so reasonable that those advantages will be attractive and we hope it works out that way.

TCAS II provides carrier protection. TCAS II should be less expensive than the full BCAS system we were pursuing and should provide the same degree of protection. We believe the motivation is there for users as soon as equipment is available.

Mr. GLICKMAN. But it is not your intention to mandate either carriers or general aviation aircraft to carry any form of collision avoidance system then?

Mr. ALBRECHT. Not at this time.

Mr. GLICKMAN. Might that decision change? What would cause you to change your mind?

Mr. ALBRECHT. It is a policy but I believe it depends on industry response.

Mr. GLICKMAN. I suppose I have some concern about this conflict, this regulatory conflict. We are talking about an item, TCAS I, a simple system, casting $2,500 or so?

Mr. ALBRECHT. On that order.

Mr. GLICKMAN. While new aircraft might have this as an optional device, what incentive is there for existing aircraft to put one on if there is no requirement to have one even in a terminal control area?

Mr. ALBRECHT. The opinion is equipment on the order of $2,500 represents a reasonable level if you get something for it. In TCAS I we believe potential advantages are significant and would be considered.

Mr. GLICKMAN. Do you think it may be possible that the insurance carriers would have an interest in seeing that their people have those kinds of equipment on the airplanes? Would that be one of the incentives?

Mr. ALBRECHT. I would think that would provide motivation; yes, sir.

Mr. GLICKMAN. My second question is: Have you done an extensive amount of work in the human factors element? When we were looking at the screen on TCAS II there was a lot of information coming to this pilot. Do you reasonably believe the pilot can handle all that information?

Mr. ALBRECHT. In terms of minimum TCAS II requirement we believe displays exist and have been flown that show the pilot can handle that type of information. People talk about extensions in terms of cockpit information. Should you provide cockpit display? This is a human factors issue in terms of where the pilot spends his eyeball time.

We are not ready to say any kind of displays in the cockpit are satisfactory, but we are ready to say basic information available from TCAS can be absorbed.

Mr. GLICKMAN. So there is no problem with the human factor as far as you are aware?

Mr. ALBRECHT. We don't believe so, Mr. Chairman.

Mr. GLICKMAN. In your statement you indicate this is a collision avoidance capability which is totally independent of the ground and can reliably operate in all high density traffic predicted for the year 2000.

Is this a fundamental difference between TCAS and the system you proposed before the BCAS system?

Mr. ALBRECHT. No. There is no basic change in our attitude that it takes a mix of ground and airborne systems to provide complete protection and they complement each other.

If you ask what is the primary protection mode we still believe it is the fundamental ground system, but the Administrator wanted to be sure whatever airborne system was employed would not be dependent upon operation of ground equipment, that ground equipment failure would not invalidate airborne equipment, and that has been achieved. That is different from our previous course.

Mr. GLICKMAN. Well, but you are not shifting responsibility—or maybe you are. Is one of the effects of this to shift air traffic responsibility from the ground based system into the cockpit?

Mr. ALBRECHT. I don't think we can come to that conclusion, Mr. Chairman. The division of responsibility between the cockpit and the ground is certainly a continuing question. We continue to examine it but we have made no fundamental change in our attitude.

Mr. GLICKMAN. What you are saying to me then is that it may be an evolving situation?

Mr. ALBRECHT. Yes. As better and better information becomes available we are interested to see it gets used, but we are not saying we should shift responsibility from ground controller to the pilot.

Mr. GLICKMAN. My last question: What you are basically saying is that you will come up with a set of guidelines? FAA will say we

are going to move in the collision avoidance area. These are the kinds of equipment that will satisfy our guidelines. Others wouldn't; these will. You don't have to install them, however, at least right now.

Mr. ALBRECHT. But we hope you will.

Mr. GLICKMAN. You hope they will and, as I understand it, if people don't install them then you reserve the authority on the policy side of the picture to mandate it if you think it is necessary.

Mr. ALBRECHT. That is right.

Mr. GLICKMAN. Thank you.

Mr. Goldwater?

Mr. GOLDWATER. In which ways are TCAS II better than active BCAS?

Mr. ALBRECHT. There are several features, Mr. Goldwater. As you pointed out earlier, the whole TCAS program has been one of evolution and we think this is the final step in that evolution.

Three characteristics that TCAS II has that active BCAS did not have are, one, cross link capability, where TCAS II can talk to TCAS I and provide maneuver intent information. That is a simple addition.

Two, capability to operate in high density areas. That is an extremely important characteristic because previously when you and the subcommittee reviewed the full BCAS program we felt it took a passive detection system to provide that capability. That is now no longer true.

Three, TCAS II can provide the capability for horizontal maneuver which active BCAS cannot do. These are the three fundamental differences and improvements.

Mr. GOLDWATER. The question of time for implementation keeps cropping up. You already published in the Federal Record some standards or proposals on BCAS. Now, I assume those have been withdrawn and you are preparing to publish something in the Record on TCAS.

What is the sequence and time frame involved there?

Mr. POZESKY. Let me try to answer that. Let me handle TCAS I directly. We are not planning on continuing any research and development for TCAS I. We are going to issue standards, issue design guidance and I think that will provide everything that is necessary for industry to get into production for TCAS I.

We will do that in April 1982. So TCAS I definition, any design guidance for industry, will be available April 1982.

TCAS II

Since Administrator Helms made the announcement of TCAS II, we have been working closely with industry, with the airlines, with our manufacturers, like Dalmo and others. We are very positive we can develop a MOPS, which is minimum operation performance standards, which is an industry development document really developed by industry working through a Radio Technical Commission and Aeronautics [RTCA] Committee.

They are targeting by the summer of 1982 to have a description of TCAS II so the manufacturers can go to work on the actual design. We have talked to our manufacturers and I believe at this

point we are going to be in test of TCAS II for about another 12 to 18 months at the outside. From that point on I don't see any reason why it can't go directly into production.

We believe we are about 36 months away from having TCAS II into production. That compares to about an 18-month period from today for the active BCAS. So we are very hopeful that the time difference will be much more like a year to 18 months rather than 2½ years.

We don't see any need to go that long in the difference at this point.

Mr. GOLDWATER. So you are talking about 1½ years in addition beyond when BCAS would have been available?

Mr. POZESKY. When active BCAS would have been.

Mr. ALBRECHT. It is important to compare TCAS II with the full BCAS schedule because they provide equivalent capability. As you pointed out, operation in high density areas is very important to the Los Angeles basin. Active BCAS would not provide a capability in a high density area such as Los Angeles where TCAS II does.

TCAS II represents an improvement in the schedule. It will be available earlier than full BCAS equipment could have been available to solve the high density problem.

Mr. GOLDWATER. One of the criticisms of ACAS is that in order for ACAS to work, everyone has to be so equipped. Is TCAS similar in this respect?

Mr. ALBRECHT. This system has all the advantages you are familiar with on the BCAS system. You are protected against the people with transponders, either ATCRBS or DABS.

Mr. GOLDWATER. One of the things I am looking at is ways in which TCAS is better than BCAS and whether that would justify an additional, 1½ years. Actually, knowing the slow way FAA works, 2½ years might be more realistic.

Mr. POZESKY. Let me mention what I think is a very, very fundamental and very important difference. Our active BCAS program, as we have testified and you are fully aware, was density limited. It had a problem that it could not cope with the high density areas, some of which we have today, most of which are predicted for the future.

The Los Angeles basin is perhaps the leading example of that problem where we have actually taken flight data for the active BCAS system in Los Angeles and showed that today there are some performance difficulties.

I have with me a chart on which we have tried to capture where active BCAS might be density limited in the future as compared to TCAS II. I would like to just give this to the committee.

I cannot project it but there are a substantial number of terminal areas and high density areas where the active BCAS system would not have provided the kind of protection we wanted, that is, it was limited because of the technology that it used.

TCAS II is going to overcome that problem and that is in my mind an extremely fundamental difference and an important difference between those two devices.

Mr. GOLDWATER. That chart shows that BCAS would not have prevented the San Diego collision. However, in previous testimony

before our committee you seemed to indicate that BCAS would have prevented the San Diego crash.

Mr. POZESKY. That is where we expect by 1995 the densities to be, above 0.02, Mr. Goldwater, and it should be labeled that. I am sorry it is not.

At the time of the San Diego accident active BCAS would have handled that problem, provided another alert. You want to be careful when you talk about preventing a crash, because any BCAS really just provides the pilot with another alert.

It is up to the pilot to take the final evasive maneuver.

Mr. GOLDWATER. That is an important distinction. It is a tool to help the pilot make decisions. In and of itself it wouldn't prevent anybody from plowing into someone else. But the fact still remains that if BCAS had been in place during the San Diego crash there would have been additional information for the pilot that could very well have prevented that crash if it had been utilized. Let's put it that way.

My concern is, do we have to wait another 1½ or 2½ years to have these things? Is it justified? Is there enough additional capability in TCAS to justify the additional delay past when BCAS would have been available?

Mr. ALBRECHT. That is a good question, Mr. Goldwater. What we are trying to say is that the TCAS decision represents an acceleration of the time that protection equivalent to full BCAS system would be available. Full BCAS protection is the kind of protection you need in high density areas, such as Los Angeles.

Mr. GOLDWATER. One last question: What is the procedure to interface or implement this through ICAO? Can we proceed unilaterally without the ICAO process having some influence in it?

Mr. POZESKY. I think that issue was handled back in April, if my memory serves me right. In April we had a worldwide meeting with ICAO in which a variety of collision avoidance approaches were discussed and indeed ICAO adopted the basic BCAS strategy which we were pursuing at that time.

TCAS is an evolutionary step of that and there will really be, to my knowledge, no difficulties. My view of that is the international community has really agreed on the basic technology for the system and family of systems that we will be pursuing of which TCAS is a part.

There will not be any difficulty that I anticipate with the international community on the questions.

Mr. ALBRECHT. The important decision was for ICAO to agree and standardize on the mode S format which TCAS uses.

Mr. GLICKMAN. Mr. Dunn.

Mr. DUNN. I am impressed, gentlemen, that you have moved a lot further ahead. Whether or not it is an extra year and a half in terms of solving some of the problems, we are now including general aviation. Before, the only way an airliner would be able to detect general aviation was to have the $50,000 equipment in the aircraft. He could pick up a smaller transponder with general aviation. General aviation would never have been aware of it. But, more importantly, with the $2,500 TCAS I in general aviation—which is also a big segment of our traffic—while they will not have command modes, they will have a collision alert warning. So I think

we have come a long way. Even if it takes an extra year and a half, we are including such a high percentage of total traffic that it is well worth the wait. My question to you is if we have indeed solved a couple of the big problems? What are the other problems that we have not solved yet? You touched on them and maybe there are others. One big problem I see you have not touched on yet is this decision between who is controlling, whether we have ground control or whether we have pilot in command. Aviation has gone from pilot in command to pilots listening to ground control.

He tells me to descend 18. If I decide I did not want to I could do it, but I would have to give a good reason why I do not want to descend 18. If everything is going right on ground control, the lights should never go off, true?

Mr. ALBRECHT. I do not think you can say that, Mr. Dunn. In the terminal area there is enough traffic around—even with separation being maintained as it should there would still be a cockpit warning.

Mr. DUNN. Then I see a big problem. I am the pilot. I get this warning light or command to climb 500 feet. And we are talking about the 30 degree with new antennas. How do I know that ATC has not 30 seconds before been aware of the two aircraft and is about to issue an order to either one of us for avoidance? I make up my own mind because I get a command to climb 1,000 feet. ATC was about to tell me to descend 500 feet. We have 20 airplanes doing that. Who is running the show? We have not solved that.

Mr. ALBRECHT. Perhaps airways traffic people would like to address that question later, but nothing has fundamentally changed in the division of responsibility because of the TCAS demonstration. It is true that with TCAS I alert light in the terminal area it will likely be on most of the time, and that is not the area of primary benefit. The area of primary benefit is on routes where the presence of that light means get your eyes out of the cockpit and look around because there is somebody there. So for $2,500 it is not a perfect solution.

Mr. DUNN. I am concerned about the problem of who will make the ultimate decision.

Mr. GLICKMAN. Are you basically saying that you might get an order on TCAS to move up 500 feet while the ATC center might have sent somebody down 500 feet 2 seconds before?

Mr. DUNN. Yes. I do not think we have addressed that area of the problem, and I think it is a potential problem.

Mr. POZESKY. I agree there is the potential. What we have worked on in TCAS II is the design in which the command is really not given until it is really a last-minute situation, where you have got 30 seconds or so to move up or move down, and that inflight test has turned out to be adequate. I want to emphasize the kinds of command and avoidance actions we are proposing turn out to be very gentle. You are talking about a relatively modest vertical displacement to resolve the conflict. Visions of sudden maneuvers on the part of air carriers are not true.

Mr. DUNN. I am not talking about drastic vertical moves. I get a command to go up 500 feet and air traffic control will solve the problem 10 seconds later by having me descend 500 feet. Multiply

that by all the planes coming into Los Angeles. Who is running the show?

Mr. POZESKY. If you get that command, air traffic control will not have already solved the problem. We are talking about 30-second or so warning time. And it really is a case where something has gone wrong.

Mr. DUNN. Is not part of the answer the fact that the same command is also going to air traffic control telling what you are doing to those two aircraft? Are they not alerted at the same time?

Mr. POZESKY. Yes. I think the air traffic control people have the ability to know what may be happening on TCAS, but I thought maybe there was confusion in your question, Mr. Dunn. I thought you were referring to the air traffic controller issuing a conflicting command.

Mr. DUNN. I am saying I am at 5,000 descending down. I get an alert to stop descent. Is air traffic control in the system and getting the same alert that this aircraft has been told to stop his descent?

Mr. ALBRECHT. Before that alert is issued, air traffic control system on the ground will be aware of the situation. It is predominant in terms of who is in charge. Air traffic control system on the ground is in charge. Airborne collision avoidance system is backup in case the ground system does not function.

Mr. DUNN. I still think we have a problem with this area of command and control.

Mr. POZESKY. The whole concept and design of the system is the air traffic control system on the ground be predominant. It will resolve this conflict. Only if that is not satisfactorily done will this box go off. In that situation I do not see a conflict any longer.

Mr. DUNN. That is where I still see a conflict. I understand what you are saying, but I think air traffic control people should also get the same signal. I do not know how much harder that is to implement. You were there. They were not aware. If they are also flashed and made aware that this aircraft is stopping its descent or increasing its descent, then they can make adjustments for the other 15 aircraft they are handling. If that is part of it.

Mr. ALBRECHT. If there is an airborne alert, we would expect ground system should be told through data link.

Mr. DUNN. I think that would solve the majority of it.

Let me follow on up. I want to make it clear. I realize this administration is not very anxious to enact new regulations that will perhaps tarnish its image, but I would tell you in all candor that unless you have some form of phased-in mandate, in my judgment you are not going to get a very large percentage of total aircraft covered. I agree that perhaps you would not want to have a mandate that is oppressive and immediate, but I think we are kind of spinning our wheels here if we do not think you are going to enact a whole new set of criteria and just let people pick it up if they want to. So I realize that from the perspective you are coming from it might not be appropriate to come out with a set of mandated regulations right now, but I hope that you use good judgment and realize they might be needed.

Mr. FENELLO. I think your observation is very appropriate, and when we get to that point I can assure you we will look at that. I think we just feel it is not the time yet to address that problem.

Mr. GLICKMAN. What you are saying then is that you have not ruled it out yet?

Mr. FENELLO. Absolutely not.

Mr. GLICKMAN. Going back to the modernization of the air traffic computer system. Now could that conceivably take care of some of the problems that Mr. Dunn was talking about? For example, if you had a more modern set of software and hardware, and were tracking aircraft, might you be in a position to address the concerns Mr. Dunn expressed? I am worried about what he is talking about, too, whether the ground will know and prepare itself when you have lots of traffic in an area and a pilot knows something that ground control does not immediately know. Will this be part of the modernization of the ground system?

Mr. ALBRECHT. Coordination will be part of the program, yes.

Mr. FENELLO. Getting away from the technicians who might be reluctant to get into that—today we have a complementary system where the pilots' actions and reactions complement the reactions and actions of the man on the ground. There is a longer time interval involved today than there will be when this technology will be available, but that same interaction will always be taking place with one complementing the other. Today a pilot will take evasive action facing a severe thunderstorm and advise ground he is doing that and ground adjusts, reacts to that and adjusts its traffic and instructions. I think the same thing will apply in the future when we get this technology available to us, but it will enable both ground and pilot to get information sooner and be in a position to react sooner.

Mr. DUNN. One more question. I see a potential problem. The next logical step in this is a complete cockpit display for every aircraft, not only in terms of a warning light going off or a command decision, but also in terms of aircraft around us being displayed as on the big screen there. It is something the Airline Pilots Association has talked about. I think I am opposed to this. We are going to have pilots up there making the decision that this guy looks too close to me. I have a wife that flies. She hears another aircraft on the radio and she thinks we are too close.

Mr. ALBRECHT. You are right. We would not support a position that says give more information in the cockpit. You would then transfer responsibility for separation to the pilot. We are conducting a joint program with NASA as you know with their airplanes on various cockpit displays to see what they can do.

Mr. DUNN. What I am trying to say is with the new technology we also have to examine the role of the pilot in command which is typical, and ground control, and make a very firm understanding in both parties' minds as to who is doing what at what times. Otherwise we will end up with more problems than we solve.

Mr. ALBRECHT. That is correct.

Mr. GLICKMAN. We thank you. We need to move on and hear from Mr. Smith. We appreciate your testimony.

Our next witness from FAA is Bob Smith, Chief, Air Traffic Division, Western Region.

Mr. SMITH. Mr. Chairman, members of the subcommittee, I am pleased to be here today to provide you with an overview of the air traffic control system in the Los Angeles basin. The air traffic in

this area is among the heaviest in the Nation. The Los Angeles basin covers 3,000 square miles, and contains 14 airports which have FAA control towers, 5 military airports, and 9 private airports without towers. The 19 controlled airports accounted for over 4.6 million operations in 1980. Statistics for 1980 also identified Long Beach, Santa Ana, Van Nuys, Los Angeles International, and Torrance Muncipal airports among the 20 busiest airports in the United States, with an aggregate traffic count of almost 2,700,000 operations annually. Due to the complexity and geographical location of the airports, Santa Ana and Van Nuys airports are most subject to saturation of airspace. As a result of so much aviation activity in one place, traffic flows in the Los Angeles basin are very complex. I think it would aid the subcommittee's understanding of these traffic flows to be able to view the actual charts used for the various operations as they are described to you. Therefore, at the end of my statement, I will utilize these charts to describe the traffic patterns in the Los Angeles area.

Naturally, the FAA is concerned with insuring that aircraft operations in the Los Angeles area are conducted safely, despite the congestion caused by the sheer volume of traffic. Many of our efforts appear to be paying dividends. In 1980, 5 midair collisions involving 10 aircraft were reported, and through July in 1981, there has been 1 collision involving 2 aircraft. In 1980, there were 21 reports of near midair collisions; for 1981 there have been 16 such reports. It should be noted, Mr. Chairman, that reports of near midair collisions by pilots can cover a wide range of occurrences. There are three basic types:

One, critical—a situation where collision avoidance was due to chance rather than pilot action. Less than 100 feet of aircraft separation would be considered critical.

Two, potential—an incident which probably would have resulted in a collision if no action had been taken by either pilot. Closest proximity of less than 500 feet would be a rough approximation of a potential near-midair.

Three no hazard—when direction and altitude would have made a midair collision improbable regardless of evasive action taken.

Only about 20 percent of those near midair collisions were of a critical nature.

In 1980 there are 24 system errors reported in the Los Angeles basin; in 1981 there have been 11. Again, a reported system error can encompass many things. The definition of a system error is an occurrence which results in less than the applicable separation minima between two or more aircraft, or between an aircraft and the terrain or other obstacles and obstructions. Our separation standards have safety margins built into them; thus, the violation of a separation standard does not necessarily constitute a safety hazard. For instance, where a 5-mile separation of aircraft is required, if actual separation of aircraft were reduced to 4.5 miles this would be considered a system error, although there would really not be any threat to safety.

Let me describe some of the measures we have taken to improve the safety record in the Los Angeles basin. In conjunction with user input, we have developed a VFR flyway chart which identifies to general aviation pilots general routes and blocks of altitudes in

which they can fly to avoid heavy flow areas of high performance aircraft. That is the chart behind you. More than 50,000 of these charts have been distributed to pilots.

User input was also utilized in modifying the geographic boundaries of the Burbank Terminal Radar Service Area (TRSA) to better serve the flying public. A TRSA is airspace surrounding designated airports wherein air traffic control provides radar vectoring, sequencing, and separation on a full-time basis for all IFR and participating VFR aircraft. The changes to the Burbank TRSA eliminated areas in which VFR pilots were choosing not to utilize these services and added areas where pilots had requested such services. Thus, the purpose of the TRSA will be better carried out with the new boundaries. The Long Beach and Santa Ana areas are being considered for TRSAs by the end of 1983.

We have modified the Los Angeles Airport VFR corridor procedures, and pilots have been briefed on how to use a self-announce frequency for ingress/egress information. This procedure comes into effect in designated locations where a pilot tunes into a prescribed frequency and announces over the air that he is entering or leaving the area. The information is transmitted to other pilots in the area and is designed to increase pilot awareness of nearby planes.

We have just completed the implementation of actions necessary to insure proper ingress/egress information for pilots using uncontrolled airports, including the advertising of proper frequencies and facilities that provide radar service, and appropriate traffic pattern information. In order to increase general aviation pilot awareness, a graphic chart depicting turbojet arrival/departure routes for Los Angeles International was published in the class II NOTAMS on August 20, and it will be carried in the Airport/Facility Directory thereafter. This will promote safety by enabling general aviation pilots to avoid these areas, and thus decrease the mix of turbojets and propeller-driven aircraft.

Finally, the Southern California Association of Governments has developed two task force teams made up of interested user groups plus local air traffic representatives and local government officials to review procedures in the Van Nuys and Ontario areas. We will carefully study any recommendations they make, and implement those which are consistent with our mission to promote the safety and efficiency of the system.

Mr. Chairman, I would like to echo the remarks made by Mr. Fenello regarding the rebuilding of the air traffic control system. Here in the Los Angeles basin we are working as hard as possible to manage our current resources so that we can provide as much service as possible to system users, without compromising system safety. Safety has not been compromised in this region, nor will it be as we rebuild the system.

At this point, Mr. Chairman, I would like to hand out one of the charts Mr. Goldwater already received in the mail from us. I would like to utilize two charts I have back here.

The traffic flows in the Los Angeles basin are very complex but organized. To depict the plan of the general aviation flow pattern in the Los Angeles area, that is IFR and VFR, we have charted the

IFR portion. The VFR flyways will indicate on the small charts handed out, the traffic flows for VFR aircraft.

First the IFR flows into and out of the Los Angeles area are depicted on the chart. This is into Los Angeles International Airport, which is the hub that generates the general traffic flow for this area. The IFR flows shown are arrivals depicted by the solid lines inbound from three different areas. The broken arrows indicate the departure flows going out of Los Angeles. This controls the basic flow in the area, from the east all the way around to the north northwest. A portion of the area up here, the northeast, is more or less controlled by the traffic flow out of Burbank airport. We have an overlay showing this flow. The red arrows show the flows into and out of the Burbank area. These are the IFR flows into the area. All aircraft utilizing these routes are cleared in positive control with positive separation being issued either by altitude or by radar. The VFR flyway chart which we have developed takes into consideration altitudes that aircraft are flying IFR and has enabled us to segregate the VFR airplanes flying the charted routes from most of the heavy, high-speed jet traffic. That is the key to development of that chart. We are proud of that. The flows of all IFR traffic is separated by our ATC system by altitude or by radar.

The VFR flyway corridor we mentioned—I would like to depict it at this time—was developed over the years. There have been improvements lately. I mentioned the frequency in my testimony. Initially the corridor was established for VFR general aviation pilots to fly over the Los Angeles Airport. We had the control tower situated there and we said if you are going northbound, stay to the east of the tower. If you are going southbound, stay to the west of the tower. We had feedback from our users that this was not working out at all times due to something they call smog. Taking that feedback right away, we established a radial. This 132 radial goes over the tower. If you stay to the east of the radial going northbound and to the west going southbound you will be able to keep yourself away from the other aircraft in this area. The corridor altitude is above 2,500 feet and below 5,000 feet; IFR airplanes cannot fly through there.

We also just recently established a frequency for them to announce themselves. Before they enter the corridor they can announce that they are going in and what their altitude is, and when they exit they can announce when they are out of it. So these are some of the things we are doing in the basin to handle traffic.

Mr. GLICKMAN. Thank you, Mr. Smith, for your testimony.

Mr. Goldwater.

Mr. GOLDWATER. Thank you.

Mr. Smith, you are the chief of the air traffic Division of the FAA Western Region?

Mr. SMITH. Yes, sir, I am the Air Traffic Division Chief.

Mr. GOLDWATER. You are directly responsible for developing procedures for IFR and VFR traffic?

Mr. SMITH. Yes, sir.

Mr. GOLDWATER. Have you actually taken radar tracings and photographs over a period of time to see where the most densely used areas of the airspace are located?

Mr. SMITH. We have in the past. I do not have the data available, but they have studied this and possibly there are, I guess, photographs available, but we do not have them available in the regional office at this time. Washington has worked on this project at different times.

Mr. GOLDWATER. Is that something you do on a regular basis?

Mr. SMITH. Yes, sir. The facility chiefs are responsible for developing the procedures in their facility. The traffic flows I have depicted here are predicated on the L.A. TRACON and the Burbank approach control area per se. We also have Ontario approach. They have committees that they set up and they study the traffic flows on a routine basis. One of the things we have done involves the SCAG group in the Burbank and the Ontario areas. They are working on these types of procedures with our people, and whatever recommendations they come up with we will consider them at that time. If they are appropriate we will implement them.

Mr. GOLDWATER. Over the Los Angeles International Airport there is a terminal control area which extends out eastward quite a ways. Because of the altitude restrictions in the TCA, general aviation pilots who are not equipped with transponders, mode C, are precluded from using that airspace. So in order to fly from A to B they have to transverse around that TCA. That is all right if only one airplane is doing that. But on a nice Saturday or Sunday afternoon you get a convergence of aircraft concentrated in specific areas because all of them are trying to get around the TCA. I speak specifically of the VFR corridor, the airspace over the San Fernando Valley, and the activity that occurs southeast of Long Beach down in the general training area. Doesn't this TCA in fact set up an even greater possibility for an accident?

Mr. SMITH. The TCA has been in place for a number of years in Los Angeles. The VFR chart that we developed provides a means for the general aviation pilot to fly by the freeway system. It was not predicated on navigational aids for VFR aircraft to transit the TCA without circumnavigating it. That was one of the reasons we developed the chart. We feel that it is very effective. Also, the blue routes on the chart are clear of the TCA for the general aviation pilot to proceed through the Los Angeles basin, and it is not predicated on the navigational system. It is predicated on the freeway system basically.

Mr. GOLDWATER. Is that not an accurate statement, though, that because of the TCA you do get a concentration of general aviation pilots just outside the TCA?

Mr. SMITH. That is accurate.

Mr. GOLDWATER. Over the past years when I fly in the Los Angeles basin, I generally ask for radar traffic advisory service. Usually the controllers are too busy to provide it. Has this been a complaint you have received in your office to any great extent? What perhaps might be done to improve that kind of information being made available to VFR pilots?

Mr. SMITH. We are always interested in providing the advisory service, but I might add the advisory service is what we call an additional service, and if there is saturation of traffic at the time that we are handling an IFR system, it may not be available. I might say that during this period of time we have metered our

traffic with the revised program where peaks and valleys in our traffic flows have been evened out, and therefore the advisory services are probably more readily available. With this in mind we would hope that we could continue in this area.

Mr. GOLDWATER. What will be the effect on aviation safety in the Los Angeles basin as a result of the FAA's intention to move the FAA office up to Seattle? I might ask Mr. Fenello to comment on that.

Mr. FENELLO. It will have no effect. There will be no change in the service provided the users if it does take place. As you know, we are contemplating a reduction in the number of regions at various locations around the country. The change is so designed that if it does take place, it will not affect the user services being provided. It is a movement or consolidation of top managerial functions and not those levels that interface with the user, you the pilot or the fixed-base operator, or airport operator. All of those services will continue. Those individuals will stay in place.

Mr. GOLDWATER. Even though you are over 1,000 miles away, you still think you can perform effectively in addressing the problems of southern California?

Mr. FENELLO. We have no doubt about that, absolutely.

Mr. GOLDWATER. I want to tell you a lot of people in the aviation community are greatly concerned about it. I am hopeful there will be some kind of review of that decision.

Mr. FENELLO. We are also concerned about it, and will insure that the right people stay in place.

Mr. GOLDWATER. Thank you, Mr. Chairman.

Mr. GLICKMAN. Mr. Dunn.

Mr. DUNN. No questions.

Mr. GLICKMAN. Thank you, Mr. Smith, for your testimony. We thank FAA for their testimony.

Mr. Fenello, we particularly appreciate your being here.

Next we have an industry panel. We have the Air Transport Association as well as a representative from the aircraft manufacturing industry, Mr. Snodgrass from Aerospace Industries of America. We have Mr. Hardaker from the Air Transport Association. Mr. Carver also is with the Air Transport Association. We welcome you here.

It is a pleasure to hear from the Air Transport Association. We appreciate your input into this committee and subcommittee on many occasions before, as well as to the Public Works Committee in the House. You may proceed. All the statements will appear in their entirety in the record, if you so desire, so witnesses may feel free to summarize if they wish.

STATEMENTS OF WILLIAM T. HARDAKER, ASSISTANT VICE PRESIDENT, AIR NAVIGATION AND TRAFFIC CONTROL, AIR TRANSPORT ASSOCIATION, ACCOMPANIED BY GEORGE CARVER, DEPUTY DIRECTOR, LOS ANGELES REGIONAL OFFICE; AND JOSEPH C. SNODGRASS, DIRECTOR OF AVIATION PROGRAMS, AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.

Mr. HARDAKER. Thank you, Mr. Chairman.

Chairman Glickman and Congressman Goldwater, as you have mentioned, we have appeared before this committee on numerous occasions, and especially on this subject. I am Bill Hardaker. I am assistant vice president of the Air Navigation and Traffic Control Division of the Air Transport Association of America.

As you all know, the Air Transport Association represents virtually all of the U.S. scheduled air carriers. I am accompanied this morning by Mr. George Carver, deputy director of our Los Angeles regional office, who has been here in Los Angeles 15 years or more, who is well qualified to address those questions posed by the subcommittee relative to air traffic safety in the Los Angeles basin. We are pleased to have this opportunity to join with our colleagues in the industry to present our views on the recent changes in FAA's collision avoidance system programs and air safety in the Los Angeles area.

We were surprised, as possibly others were, by FAA's announcement in June of a new policy on collision avoidance which included, among other items, two levels of a threat alert and collision avoidance system—TCAS I and TCAS II. This was unexpected after the FAA-sponsored active beacon collision avoidance system—BCAS—conference held at Dulles Airport in January 1981 and the hearings by this subcommittee in April 1981. On both those occasions FAA indicated that they were still proceeding toward the implementation of active beacon collision avoidance—BCAS—the discrete address beacon system—DABS—and the automatic traffic advisory and resolution service—ATARS.

While TCAS II is essentially active BCAS with directional antennas and an added cockpit display, it does present some problems to the airlines. These are:

The inclusion of directional antennas as a minimum capability for airline aircraft will cause a delay of perhaps 2 or 3 years in availability of an effective collision avoidance system capability in these aircraft.

The directional interrogation and antenna requirement appears, without any increase in safety, to place a significant cost burden on the airlines. This burden could be avoided if FAA implemented DABS—mode S—ground facilities with some ATARS functions at four or five terminal areas. The overall cost would be substantially lower.

An additional increase in cost to airlines is also incurred by the requirement for airline aircraft to carry significant additional computational capability in order to provide general aviation aircraft TCAS I with information on their position relative to the airline aircraft. Further, in our opinion, the value of this information for collision avoidance is questionable.

While the additional displays are not yet clearly defined, it appears they will include elements which have not yet been shown to be effective for collision avoidance, and need further investigation of associated human factors and their role. At this stage of development, one can question whether or not they might detract from collision avoidance.

In addressing the new collision avoidance policy, the FAA Administrator also announced he was rescinding plans for a terminal control area at Tampa, Fla. By this action and a subsequent direc-

tive to the field, we believe FAA has signaled a new policy on establishing terminal control areas at busy terminals. The airlines continue to believe that the terminal control area program should be enhanced and expanded into other areas rather than deferred, as it represents a major element in FAA's separation assurance capability.

As members of the committee well know, the airlines have actively sought means for preventing aircraft collision since the mid-1950's. Since then, the FAA has implemented many improvements in the ATC system that were designed to reduce the collision hazard, such as the automatic altitude reporting transponder, conflict alert, et cetera. Airborne collision avoidance systems have also been developed and proposed through the years, but it seems that each time they reach a point of possible implementation, a better system would appear on the horizon. This could now be the case, with the TCAS concept being the enemy of active BCAS. We hope not; we hope that both active BCAS and TCAS can move forward together and not delay the attainment of an initial airborne collision avoidance capability.

We believe active BCAS satisfies the necessary airline requirement and should be established as the national standard. To further that goal, the Radio Technical Commission for Aeronautics—RTCA—should continue the work begun by Special Committee 147 to develop a minimum operational performance standard—MOPS—for active BCAS. Concurrently, a capability could be incorporated in the standard which would permit it to grow into the minimum TCAS II when that technology has been fully developed and proven, and has met acceptable standards of cost. This approach would also provide the necessary capability for international operators who do not foresee the need for TCAS II type capability.

In this regard, we are not convinced of a real need for directional interrogation capability in TCAS II. The justification for directional interrogation is based upon a traffic density forecast that we believe is questionable. That forecast was based upon data collected here in the Los Angeles area. Specifically, the criterion of concern is the 0.4 aircraft per square nautical mile value chosen for TCAS II performance. This value, we are told, is an extrapolation from recent measurements indicating a peak value of transponder-equipped aircraft of 0.12 aircraft per square nautical mile. The 0.4 aircraft per square nautical mile assumes a significant future traffic growth and that all of the aircraft in the Los Angeles area would be equipped with automatic altitude reporting ATCRBS transponders, not DABS.

We question such an assumption for several reasons. First, it is doubtful that this traffic level can be handled by the basic ATC ground surveillance system using ATCRBS. If that traffic level were actually reached, DABS—Mode S—would need to be implemented for ATC surveillance alone. Further, it should be recognized that all the BCAS/T-CAS equipped aircraft, as a minimum, would have DABS—Mode S—transponders. This is contrary to the forecast's assumption that all aircraft would have ATCRBS. Every increase in percentage of aircraft equipped with DABS—Mode S—

improves the capability of basic active BCAS to handle higher traffic levels.

In addition, we are told that, with modestly lower traffic density criterion, other active BCAS enhancements could also significantly improve its performance in high-density traffic situations. We understand that one such improvement might be an improved "whisper-shout" technique incorporating additional levels. "Whisper-shout" is a technique developed in the active BCAS program which sorts out replies from ATCRBS equipped aircraft in close proximity by interrogating from the BCAS at different power levels with appropriate use of suppression signals. Thus, we believe that recognition of reasonable levels of ATCRBS automatic altitude reporting traffic, together with BCAS enhancements, would avoid the need for costly directional interrogation in TCAS II.

It should be noted that little, if any, attempt was made to date to increase BCAS traffic handling capacity because ATARS, not BCAS, was projected to provide service in these high-density traffic areas. We continue to believe that implementation of DABS—Mode S—ground facilities, together with a simplified version of ATARS, is a better solution than adding sophisticated levels of directional capability to airborne collision avoidance systems.

Taking these points together, we believe that active BCAS can and should be implemented without further delay. We believe it would have the capability to operate in the probable high-density traffic for a relatively long time, that is to say, into the next decade, if not forever. We have suggested that FAA collect additional data, reassess the traffic level forecast, assess the limitations of the ATC surveillance—ATCRBS—system, and develop alternative improvements to active BCAS techniques.

This does not mean that we have completely eliminated consideration of a directional capability for airline use. We continue to support FAA research and development for directional receiving antennas to fully develop their technologies and thereby place us in a position where complexity, reliability, and cost effectiveness can be evaluated from hard data and not from speculation. We do not believe the directional capability should be made a part today of the national standard until the technology has been fully developed and tested.

In summary, the airlines' position on aircraft separation assurance remains essentially as presented to this subcommittee on April 3, 1981. While we have noted FAA's change in concept, we will continue to press for attainment of an early airborne collision avoidance capability as soon as possible. We see no reason why the two concepts cannot proceed in parallel.

This completes my testimony on collision avoidance as related to FAA's new direction on collision avoidance system programs.

Mr. Carver will now address safety in the Los Angeles basin.

Mr. CARVER. Thank you. Mr. Chairman, Mr. Dunn, Mr. Goldwater, I will make my comments brief. I think there has been considerably said by you yourself Mr. Goldwater and by Mr. Smith and by other people on the traffic density here in the Los Angeles basin which we live with out here. At the present time we have some 18 of our member carriers that operate into the airports of the Los Angeles basin; Los Angeles, Burbank, Ontario and Long

Beach. Our office has been very closely coordinated with FAA for a number of years on all the air space modifications, traffic procedures, routings, anything to do with anything that affects the air carrier industry out here. I think I would prefer that if any of you gentlemen on the committee have any questions at all pertaining to the scheduled air carrier operation into the Los Angeles area as it pertains to air traffic, air space, terminal control area, runway use programs or areas such as that, that you give the questions to me. Before that I would like to comment on two specific items that have been talked about. One is the terminal control area at Los Angeles. I think there is only one other individual in the room who was, along with me, involved in the initial planning of that in 1969 and 1970. There have always been discussions of a number of airplanes involved in the TCA. I think the original concept—and I don't know if that policy still exists—was to protect the maximum number of people. The VRF corridor, without expounding at length, was arrived at as a way of getting heavy traffic flow which you talked about Mr. Goldwater, north and south through the area. I might say previous to the TCA coming into effect very brutally, frankly, it was a way of life for near misses between air carrier aircraft proceeding in and out of Los Angeles eastbound and westbound and general aviation aircraft transiting the area. Many of them for whatever reason not controlled or not utilizing radar services, whether it was available or not.

Since TCA went in in September of 1971 that condition has not existed. I think it is ironic some of you in the room may recall TCA here, the terminal control area went in in September of 1971. Approximately 1 month prior to that there was a midair involving a 707, turning base to final at Los Angeles with a Cessna 150 student and instructor about 3 miles east of Los Angeles. There was no loss of life. The Cessna crash landed with injury to one individual. The 707 at Los Angeles with just the damage to the wing. It is rather ironic that that collision which could have killed probably 100 people as I recall would not have occurred had the terminal control area been in 1 month earlier than it was.

The only other thing I would like to comment on is to comment further on what Mr. Fenello and Mr. Smith said on aviation safety as it applies to the air traffic control system here in the basin. Probably on a daily basis our office, I myself or one of my contemporaries talks to supervisory pilots, airline management people, and since the start of our, shall I say unfortunate labor problems in the air traffic system of August 3, we have received nothing but commendations from the pilot group, from pilot management in the air carrier industry for the way traffic is being handled within the western FAA region. That situation exists today.

Mr. GOLDWATER. In other words the pilots and users of the system feel there is adequate service and there is adequate safety in spite of the strike action by PATCO?

Mr. CARVER. Mr. Goldwater as you know, we have suffered some in the industry from a restriction on the number of flights. We have been restricted as far as the percentage of flights. Outside of that fact the actual handling of the air carrier system within the western part of the country as I relayed to the western region director a few days ago in writing, outstanding is the one word that

sums it up. I am relaying information from such individuals as chief pilots, vice presidents of flying. I spend considerable time in the cockpit myself, riding the cockpit and talking to crews. At least in this part of the country we are well satisfied. If you have any questions I will be glad to try to answer them.

Mr. GLICKMAN. Mr. Snodgrass why don't you go ahead and then we will open it for questions.

Mr. SNODGRASS. I have a very brief opening statement which is in the form of a preface to any questions you might have.

I am Joe Snodgrass, Director of Aviation programs of the Aerospace Industries Association of America, Inc. [AIA] representing the Nation's major manufacturers of aircraft, aircraft engines and related components and equipment contributing to a safe and efficient air transportation system.

Member companies of the AIA have been working over a period of several years with the carriers and with government agencies in the development of a beacon collision avoidance system—BCAS. A great deal of progress has been made with the BCAS and we are quite confident that this system can be made workable in the near future. We concur with the Air Transport Association that this effort should be continued.

AIA companies have studied FAA Administrator Helms' June 23, 1981, announcement related to collision avoidance. Representatives attended the threat alert and collision avoidance system—TCAS—Technical Symposium and members are carefully reviewing the material presented. We have also responded to verbal queries from the FAA related to provisions for an installation of collision avoidance system components on new models. However, we are not yet in a position to fully assess all aspects of the TCAS as presented by the FAA. We therefore consider it appropriate to conduct further studies of the TCAS concept while proceeding with the BCAS system.

Thank you, Mr. Chairman. I will now attempt to answer any questions you might have.

Mr. GLICKMAN. I will ask you what I consider to be two related questions. The implication in the testimony of the Air Transport Association is that the FAA TCAS II decision will cause a delay in collision avoidance system protection. One, do you feel this delay will introduce a significant risk of a major air carrier midair collision during this 2- to 3-year period and two, would it be practical for you, for the airlines, to install a BCAS without FAA assistance as an interim step?

Mr. HARDAKER. I will take those in the order you gave them, Mr. Chairman. On the first one, no I don't think there is a significant risk of a major midair collision during the period that we are awaiting an airborne collision avoidance system because we have complete faith in the ground system. It is in the event, as was stated in previous testimony, in the event the ground system should fail for one reason or another that we should have a backup system and it should be an airborne system, one we carry with us. As density increases it is even more important that we have the backup system. It is also a very useful system when we are outside of the air traffic control system. For example it will enable us to reduce the present separation standards that are used over the

North Atlantic and the Pacific by having a backup system, one that could be termed in the vernacular of the statistical world as a tailcutter. It will cut down the number of possible near misses due to misalinements of navigation systems or other navigational errors and the aircraft get too close to one another. It would be a backup, an assurance that this could not happen and result in an unsafe situation. Your second question——

Mr. GLICKMAN. An interim method.

Mr. HARDAKER. FAA would require the issuance of a supplemental types certificate before we could put an active BCAS on board and their public statement on this has been that they would only accept the installation of such a piece of equipment if we could show that it would incorporate a provision for the minimum TCAS II capability. This we are unable to do at the present time. We just don't know how we can get there from here. Perhaps in a year or two we may be able to figure that out

Mr. GLICKMAN. But when could you put the current BCAS in?

Mr. HARDAKER. The current active BCAS could—if we really turned all out, and the industry in addition to the FAA backing us where we need their support—probably be installed within 1 year to 18 months. Then of course it would take us some time to equip the fleet which would probably be another 2 or maybe 3 years depending on how much work needed to be done on the retrofit.

Mr. GLICKMAN. Just out of curiousity, when Mr. Helms made his decision to change from BCAS to TCAS, were you consulted?

Mr. HARDAKER. No, sir.

Mr. GLICKMAN. Mr. Goldwater.

Mr. GOLDWATER. Following on to that, do you object to that type of decisionmaking on the part of FAA? ATA has always been in the forefront of pushing the FAA and the industry to develop a collision avoidance device. All of a sudden the FAA made these decisions without consultation. Does that bother you?

Mr. HARDAKER. We were surprised.

Mr. GOLDWATER. But you don't have any major objection to TCAS. Your concern is the continued delay and the additional cost. Will the directional antenna be costlier than the other antenna proposed for BCAS?

Mr. HARDAKER. Yes it will, but not substantially. We are also very much concerned about the complexity and the reliability. Once you make something more complex you question how reliable it is going to be. We are also not sure whether the so-called enhanced TCAS II that the administration has set out—the one with the fine resolution on directional information—is even in the cards as far as an airborne piece of equipment.

Mr. GOLDWATER. Mr. Carver, do you feel that the implementation of a TCA here in 1971 was a good move from the standpoint of protecting the maximum number of lives. I was reading a recent flight safety information bulletin from a particular airline that flies frequently in and out of L.A. Nationwide they reported six near misses, three of which occurred in the Los Angeles basin. Is this typical? Maybe the TCA is not everything it is built up to be.

Mr. CARVER. Did they say they occurred within TCA or outside the confines of it?

Mr. GOLDWATER. It is not clear.

Mr. CARVER. I ask whether or not it is in or out of TCA because I think it has some bearing. There could be occurrences within the TCA that I would not be personally aware of. However normally we are aware of them.

Mr. GOLDWATER. Let me read one. During climb out of LAX in a right turn—Boeing 727—flight passed within 50 feet laterally of a Piper Tomahawk in VFR conditions. ATC was not painting the Piper or aware of its presence.

Mr. CARVER. Until something like the ACAS or BCAS or absolute positive control comes in you will find if you check into any terminal control area, that there are intrusions by unknowledgeable pilots for whatever reason. The reason I asked is that one of our most serious problems is aircraft just outside TCA when we are exiting or entering the terminal control area, just outside the confines of it. We have had, I think, probably at every terminal control area I am familiar with, from Denver west, problems of this nature, where you are going into the transition area between the top of the terminal control area and positive control air space or descending. I am sure there are intrusions in any terminal control area in the country. Strictly due to the fact that there are unknowledgeable pilots or for whatever reason or maybe they do it by accident.

Mr. GOLDWATER. In helping to design this TCA did you get concerned about the bunching up of VFR pilots just outside the TCA and the possible setting up of an accident between general aviation aircraft?

Mr. CARVER. Let me back up. When you say when I designed it—in the TCA Mr. Goldwater, their was design participation by every aviation group involved. It took I believe something over a year before the final concept was arrived at and agreed at. The participants were the Airline Pilots Association, ALPA, Allied Pilots Association, Southwest Flight Crew, you name it, our organization. You have to arrive at a tradeoff situation. There is going to be a compression around any positive control airspace. But if you are going to protect the arrival and departure routes for a major terminal airport I don't know how you get away from the problem unless you sterilize all the airspace and make everyone require clearance which I am sure is not acceptable to a large part of the aviation community. The corridor here at Los Angeles was arrived at as an easier way for the general aviation people to transit the basin north and south instead of going over the top, beneath it out to the east, areas toward Ontario. They did not want to go offshore to the west to get underneath as they did not have flotation. To my personal knowledge there have been two general aviation midairs attributed to the VFR corridor. I don't know what NTSB's final findings are, but one at the south end in 1980, one at the north end over Marina Del Ray. There were two other collisions that were alluded to as being tied to the VFR corridor, one other Hughes Airport in Culver City, one at Santa Monica. These were completely outside the corridor. That is in the 10 years since it has been in existence.

Mr. GOLDWATER. What do you think would be the effect on aviation safety with respect to their move to Seattle?

Mr. HARDAKER. That is a difficult question in one aspect and that is it may cause us to change the location of our personnel that we have here in the western region so as to be closer to them. However, today we try to cover a rather large area with our western region people. It includes Honolulu as an example. So it keeps our people on the move quite a bit. I don't imagine Mr. Carver spends a lot of time at home with the area of responsibility we have assigned to him. From an ATA standpoint I think we will be able to interface with the FAA whether they are in Los Angeles or in Seattle. We would make it a point. That is our business.

Mr. SNODGRASS. We see little change as far as the manufacturing industry is concerned because most of our manufacturing members in this area manufacture transport aircraft, and under the FAA lead region concept the northwest region has handled their certification anyway so there is virtually no change in any operation.

Mr. GOLDWATER. Do you think FAA is doing enough, Mr. Carver, to anticipate the increased density of aircraft, not only within the TCA but primarily outside as shown by the flow chart. Do you think they are doing enough? Should they do more? The Los Angeles basin is probably the world's densest as far as utilization of air space is concerned. Are you satisfied that FAA is being aggressive enough in looking for possible enhancement of safety in this area?

Mr. CARVER. I have been at my present job for 12 years. I don't think there has been a time frame within that 12 years in which there has not been an ongoing look at airspace configurations of the various FAA facilities in this basin, at the routes in and out of the basin. There has been continuous modification. The FAA here is hampered by the very thing you spoke of, the concentration of aircraft and the compression of air space. It has often been said if somebody learns to fly in the Los Angeles basin you can fly anywhere in the world without any problem. I think that is true.

Mr. GOLDWATER. But you think FAA is doing enough? Do you think they are on their toes?

Mr. CARVER. Speaking for ATA, a solid yes.

Mr. GLICKMAN. Mr. Dunn.

Mr. DUNN. We have TCA, we have corridors, you name it, we have it. You said a moment ago a certain segment of the flying population would object to more restrictions on where you can or cannot fly. We would agree with that statement. What would you think, as an alternative, of a requirement that every aircraft that takes off has to be transponder equipped?

Mr. CARVER. I think that is a loaded question. That has been kicked around, Mr. Dunn, as you are well aware of, many times. Every aircraft has a transponder. I think I would answer that with a question. From your knowledge and I understand you are a pilot, do you think if every aircraft in the basin suddenly had a transponder installed that the radar systems could handle the targets?

Mr. DUNN. I don't fly in the L.A. basin so I don't know.

Mr. CARVER. I doubt it seriously. I would let somebody from FAA answer that.

Mr. DUNN. Would you rather handle too many targets or not know what you are handling?

Mr. CARVER. I am not a controller.

Mr. DUNN. I will ask the same question of the controllers.

Mr. CARVER. I know what you are saying.

Mr. DUNN. The question bounces back and forth a lot. I am a member of general aviation and I am aware of their position on it but I still want your opinion. It is a loaded question but give me an answer.

Mr. CARVER. If every aircraft had a transponder you would assume you would have positive control over every airplane in the sky. Would you agree with me on that?

Mr. DUNN. Radar does not cover the whole sky.

Mr. CARVER. Within the air traffic control system.

Mr. DUNN. Yes.

Mr. CARVER. The question I can't answer for you is whether the existing air traffic control system could handle that amount of traffic.

Mr. GLICKMAN. May I interrupt. You are all interested in pushing for a collision avoidance system. However, most of the time your threats are not from other commercial aircraft but from general aviation aircraft, and therefore those aircraft have to have something in them to lock into your system.

Mr. CARVER. Correct.

Mr. GLICKMAN. So therefore, not only is there a function of providing a radar signal for the controller but also a signal to prevent you from crashing into another airplane. So I would think you would want the answer to Mr. Dunn's question to be yes.

Mr. CARVER. Let me say one thing and I will let Mr. Hardaker take over. I was addressing the answer to air traffic controllers, not to anticollision.

Mr. DUNN. So am I.

Mr. CARVER. Then it is a twofold question.

Mr. DUNN. No. A simple question. Will we increase safety by making every aircraft transponder equipped in your opinion? Yes or no.

Mr. CARVER. If it is a transponder that participates in anticollision, yes.

Mr. HARDAKER. I would like to help George on this.

Mr. CARVER. I said that was a twofold question for air traffic control purposes, for air traffic controllers and for anticollision. Is it going to do one or both of those.

Mr. HARDAKER. We as an association would like to see the Administration mandate DABS, mode C for future aircraft that come off the line and at a time when it could be most easily accepted and mandated sometime in the future, 1984, 1985. We believe DABS can be handled by the ATC system in the high density area by the air traffic control system. We would like to see all aircraft under control of the system so ATC knows where they are. They don't necessarily have to know intent even though it is nice to know intent when you are trying to control the traffic. As an association we would like to see DABS mandated for any future buy of aircraft and eventual retrofit.

Mr. DUNN. The chairman's first question to you was in the next year is there any risk of major midair collision. Your answer was no. I don't think you believe that. There is an element of risk every time you take off. Yes?

Mr. HARDAKER. Nothing that would put it specifically into this next year. Yes we have a risk, as you put it.

Mr. DUNN. We are looking at the problems of 1990's and 2000.

Mr. HARDAKER. Risk is always there.

Mr. DUNN. I am a little dismayed at your closed attitude toward TCAS. If the problem is not this year, if the problem is not next year and if the new system will include a lot bigger percentage of aircraft, I am dismayed that you have taken such a closed attitude. There is no mandate now from FAA on BCAS or TCAS. There is nothing to stop you from going out and doing BCAS. You can do it tomorrow. I understand your cost problems, that you are afraid there will be a mandate in the future on TCAS, but I think you should be willing to explore the equipment.

Mr. HARDAKER. I meant to say that if I did not. I thought I had. We would like to see the two systems proceed together but we don't want to delay our getting airborne collision avoidance capability in the aircraft as soon as possible.

Mr. DUNN. There is no restriction on FAA that says you can't go out and put it in tomorrow?

Mr. HARDAKER. Yes there is. We must have a supplemental type certificate to put it in. It must be usable. It cannot interfere with the ground system. We are trying to show that it won't interfere with the ground system. We would have to insure that it does not. We are not convinced that the data FAA collected and used to justify the TCAS II directional capability is absolutely necessary. They are undertaking the additional work to investigate that and we should know something within the year. But during that year we are not closed to eventually going the TCAS II route.

Mr. DUNN. You mentioned cost. The estimates are $50,000 for TCAS II. In your testimony in April, that was approximately the same figure you gave us then.

Mr. HARDAKER. It is within about $10,000.

Mr. DUNN. So the big cost difference is not there.

Mr. HARDAKER. On the directional antenna we are not sure of the cost. It won't be that much more.

Mr. GLICKMAN. Thank you. We appreciate your testimony and your continued input into air safety. Our next panel is a pilot's panel. We have, from the Air Line Pilots Association, Mr. Jack Howell, Executive Central Air Safety Chairman, and Capt. H. Ray Lahr, Los Angeles Area Safety Coordinator. We also have Robert Warner from AOPA, Aircraft Owners & Pilots Association. We appreciate your testimony. As I have said to the other witnesses, your entire statements will appear in the record, if you so desire, so if you wish to summarize it would give us more time for questions and answers. Why don't we begin with Mr. Howell.

STATEMENTS OF JACK HOWELL, EXECUTIVE CENTRAL AIR SAFETY CHAIRMAN, AIR LINE PILOTS ASSOCIATION; CAPT. H. RAY LAHR, LOS ANGELES AREA SAFETY COORDINATOR; AND ROBERT WARNER, VICE PRESIDENT, ATC, AIRPORTS, AND AIRSPACE, AIRCRAFT OWNERS & PILOTS ASSOCIATION

Mr. HOWELL. I am Jack Howell, Executive Central Air Safety Chairman of the Air Line Pilots Association. With me is Capt. H. Ray Lahr, Los Angeles Area Safety Coordinator for ALPA. We are

here on behalf of the 33,000 members of ALPA who fly for 30 airlines. Many of our members regularly fly in the Los Angeles basin.

With your permission, Mr. Chairman, I will discuss aircraft collision avoidance systems and then Captain Lahr will talk about air traffic safety in the Los Angeles basin. We will attempt to be as brief as possible.

At the outset, Mr. Chairman, let me emphasize that ALPA fully supports the intent of the FAA to proceed with TCAS. We agree with the agency's statement that this system should "provide the maximum protection available for all environments for all equipped users." We believe TCAS will be significantly superior to the active beacon collision avoidance system (active BCAS) that the FAA was pursuing before it announced TCAS in June.

I am sure you remember that in previous testimony to the subcommittee, ALPA outlined what we consider the minimum performance characteristics of an airborne collision avoidance system to be. TCAS comes very close, certainly far closer than any other proposal, to meeting these characteristics.

In addition to being able to operate in dense terminal areas, TCAS has two other advantages over active BCAS. These are, one, the potential for a horizontal resolution of a conflict and, two, a general aviation capability that is so important. In short, gentlemen, we believe TCAS is clearly the way to go in collision avoidance, but some opponents of TCAS have raised questions about the availability of the system, its possible technical risks and its costs. As far as availability of TCAS is concerned, we see no reason why it should take a day longer to get TCAS than it would BCAS.

The key to when we have TCAS or active BCAS or whatever is how hard the FAA pushes the avionics industry to develop and test the necessary equipment. Administrator Helms, both in his June announcement of TCAS and subsequently, has moved very aggressively. His actions in this area and others have been far more clear and decisive than what we have seen from the FAA in recent years. Therefore, we have increased confidence that the TCAS timetable Administrator Helms has put forth will in fact be met.

There is bound to be some element of technical risk in any project like TCAS or active BCAS. However, we do not consider the risk in TCAS to be so great as to preclude proceeding with dispatch.

The technical risk in TCAS is development of the horizontal resolution needed to give horizontal maneuvers to the flight crew. They key to obtaining horizontal resolution is development of a highly accurate directional antenna. It is difficult to assess accurately the degree of technical risk involved with this antenna because development is just getting underway.

In its work on BCAS under FAA contract, Dalmo-Victor Co. has already developed a directional antenna with an accuracy of plus or minus 8 to 10 degrees. Bendix Corp. is just starting work under another FAA contract on a directional antenna with directional interrogation that could ultimately lead to accuracy of plus or minus 2 degrees. Concerning the cost of TCAS, we have no reason to question the FAA cost estimates of TCAS I and II, which, respectively, are on the order of $2,500 and $50,000. Another question

that often comes up during discussion of collision avoidance is whether an airborne device such as TCAS will shift control from the ground controller back to the cockpit. As pilots, we naturally want to have as much information in the cockpit as possible because Federal regulation specifically gives us, not the controllers, final authority for the safe conduct of the flight.

We support TCAS in part because it will give us more information. At the same time, we do not see it having any effect on the present relationship between pilots and controllers, because ALPA firmly believes the primary means for managing a high-density traffic flow is a ground based air traffic system.

Another aspect of the TCAS issue we pilots are concerned about is the question of displays. This is a major concern and we shall be following it very closely to find out just how the TCAS information will be displayed in the cockpit.

Another aspect of TCAS that will require attention is the use of mode C transponders. Such a device is the minimum necessary to provide passive protection against colliding with another aircraft. In other words, an aircraft with a mode C transponder will be able to be detected and the potential threat analyzed by any aircraft with TCAS I or II.

Therefore, in order to increase the effectiveness of TCAS, we suggest the FAA take steps to encourage aircraft owners to install these transponders. That completes an oral summary of my testimony, gentlemen, and now, if it is your pleasure, Captain Lahr will talk about the ATC situation in Los Angeles.

Mr. LAHR. Thank you, Mr. Chairman, and members of the subcommittee. We appreciate this opportunity to discuss the safety issues in the Los Angeles area.

In the interest of time, I will limit myself to the list of ATC issues provided in your invitation.

One. What are the general air traffic flow patterns in the Los Angeles area (IFR and VFR)?

The Los Angeles basin is the busiest airspace in the world. It contains 4 of this Nation's 10 busiest airports. Los Angeles International Airport dominates the commercial traffic within the Los Angeles basin. Consequently, most of the IFR routes are structured to facilitate traffic flow into and out of LAX.

However, John Wayne Airport, Burbank Airport, and Ontario Airport are busy commercial airports themselves, and their traffic flow patterns are blended with the LAX flow. The commercial IFR routes, in turn, influence the VFR routes. There is a mutual desire by general aviation and by commercial aviation to avoid each other. This requires a further refinement of the IFR routes to avoid placing an undue burden on the VFR routes.

Two. Which locations have the greatest traffic density and/or the most problems?

From a commercial standpoint, the four airports just listed have the greatest traffic density. The problems associated with these airports are roughly proportional to their traffic densities. Also, a surprisingly large percentage of the ATC problems at all of these airports are generated by noise considerations.

In an effort to accommodate airport neighbors, flight routes have been altered and flight procedures have been compromised, some-

times to the point of violating the basic principles of flying; that is, opposite-direction traffic and downwind landings in bad weather.

Three. What is the past air traffic safety record in Los Angeles, collisions, near misses, system errors, for IFR and VFR?

Los Angeles has had its share of all of the above. Considering the density of traffic here, the record is probably better than a projection of national averages would predict. This may be due to the prevailing good weather, many airports with good facilities, and high pilot awareness of potential traffic conflicts.

We have had several midair collisions in the Los Angeles basin. Practically all of them were in VFR conditions. Most of them were slow closure rate collisions in which there was adequate time to see and avoid. Some of them were under radar control.

This pattern is in agreement with the national pattern and it points up the inadequacy of the see-and-avoid concept. It is urgent that we have a meaningful airborne collision avoidance system, particularly since commercial aviation is experiencing a swing toward two-pilot crews, and that means fewer eyeballs to watch for traffic.

As you know, an airborne collision avoidance system was one of the specific recommendations of the Presidential task force that recently concluded a study of the crew complement issue.

In regard to near misses, most of us who have flown extensively in the LAX area have, at one time or another, come much closer to another aircraft than we would have preferred. The exposure is greatest near airports. In fact, we have a crisscross traffic flow situation at LAX that has generated some near misses on the final approach course.

Hopefully, this situation will be eased by the strengthening of the south runways to accommodate the widebodies and thereby avoid some of the crisscrossing over Inglewood.

In regard to system errors, wherever you have humans there will be some errors, be it pilots or ground coordinators. As an extreme example, some years ago we had a case where a radar operator was looking at the wrong target and inadvertently vectored a light aircraft into a mountain.

Four. What steps have been taken or are being planned to enhance the safety record? For example: TCA's, procedural changes, voluntary routes or corridors for VFR, traffic flow studies, et cetera.

LAX has a TCA. ALPA would like more TCA's. We prefer the corridor concept, as does AOPA, but we accept the inverted wedding cake concept such as we have at LAX. Ultimately, we see a requirement for positive separation from takeoff to landing for all commercial aircraft. That is probably quite aways downstream. It would mean establishing some form of TCA at all commercial airports and closing the gap between existing TCA's and the high altitude positive control space.

In the meantime, we are seeking compatible ways to share the Los Angeles airspace using existing facilities. We have two ongoing task force studies, task 15 for the San Fernando Valley and task 5-A for the Ontario area. These task forces are seeking ways to provide separation short of a full blown TCA.

In general, the recommendations are to have voluntary routes for VFR traffic with an enhanced system of radar advisories. IFR traffic would have designated corridors which VFR traffic would avoid.

In addition, the California Airspace Utilization Committee has several other task forces investigating areas such as traffic flow, frequency allocation, and preservation of airports. One of our major accomplishments has been achieving more effective use of the airspace surrounding Los Angeles by releasing the use of military airspace to general aviation when it is not being used by the military.

The Air Traffic User's Forum is another group which brings together all the aviation interests in the Los Angeles area. This group discusses current problems and seeks solutions. Both of these groups are sponsored by the FAA.

Five. What is being done to improve ATC's ability to give radar traffic advisories to VFR traffic?

In addition to the steps mentioned above, FAA has recently designated a special frequency for the LAX TCA. The LAX TCA has a VFR tunnel running across the airport from north to south. A lot of traffic funnels through this tunnel and it has resulted in at least one midair collision. Now VFR aircraft can tune in this special frequency and advise each other of their location.

Six. How will problems such as these be handled from a regional office located over 1,000 miles from Los Angeles?

Los Angeles is a major hub of aviation activity, and it will require a strong FAA presence, even if the titular authority is transferred to Seattle.

Seven. What will be the effect of widespread TCAS usage on ATC in the Los Angeles area?

Basically, it will enhance safety. The immediate effect is a backup collision avoidance system when operating within the ATC radar system and a stand-alone collision avoidance system when operating outside the ATC radar system. Long term, it is one more step in the electronic revolution.

Traffic flow will probably always be coordinated from the ground, but the electronic revolution will continue to put more information in the cockpit. This will ultimately make the whole system more efficient.

Eight. What will be the effect of the Los Angeles traffic density on the capabilities of TCAS?

Quite simply, TCAS should be designed with the capability to handle the projected traffic densities of Los Angeles or we won't get our money's worth. From what we understand about TCAS, it will have this capability.

Thank you, gentlemen, for this opportunity to offer our views.

Mr. GLICKMAN. Mr. Warner, you may summarize your statement if you wish and, without objection, your full statement will appear in the record.

Mr. WARNER. Since the statement will be a matter of the record I will summarize the discussion of TCAS as well as some additional items that have come to mind as a result of being in Los Angeles for a couple of days now, information that was subsequent to preparation of this testimony.

Good morning, members of the subcommittee.

My name is Bob Warner. I am vice president for ATC, Airports and Airspace for the Aircraft Owners & Pilots Association. We represent over a quarter of a million pilots nationwide. We are the world's largest aviation organization.

Of particular interest here might be the fact that more than 16 percent of our members reside in the State of California. AOPA's position on TCAS can be summarized as that we are very interested in, and we encourage the development of, TCAS, as a concept.

TCAS, as promised, is on the advantage side of both BCAS and ACAS—an argument which we hope is now history. On the advantage side of BCAS, it will give us incremental service for the first aircraft that equips with TCAS.

This is based on the fact that the signals provided and the protection of service provided by TCAS comes to us from airplanes that are already equipped in the fleet with transponders or transponders and encoders.

On the advantage side of ACAS, TCAS provides us with more independence from the ground-based system. This is particularly true for air carrier aircraft, where the law requires there is indeed to be a higher level of safety.

I will summarize AOPA's major comments on TCAS as a concept:

First, the concept shows great promise for protection not only from air carrier aircraft but also from a large number of general aviation aircraft, then possible under BCAS or any prior concept.

The development should continue. However, we will keep a sharp eye on the cost because it sounds too good to be true.

Second, the equipment should not be implemented prior to a time when it is proven. That was our position on BCAS and any other collision avoidance system that has been discussed and it is the same with TCAS. We do not wish to have a piece of equipment in the airplane that was emotionally motivated for implementation when indeed it may be counter to safety.

Third, TCAS should not be justification for additional control. We must remember that this is a backup system to the ground-based air traffic control system.

Further, there should be voluntary equippage for TCAS of general aviation aircraft.

There should be no requirement for more equipment than is currently required to fly in the air traffic control system. The current requirements, of course, include transponders and in some cases transponders and encoders in certain airspace in the United States. The question was asked earlier by the chairman as to what incentive is there for general aviation, to equip on a voluntary basis. I would suggest that the answer might be both to your right and to your left, Mr. Chairman, because there are two gentlemen who sit in the front left seat of airplanes and they know the incentive is that pilots and people that are actually onboard the aircraft are very interested in safety. They are the most interested. They are in the front row of seats at the time the accident happens and that indeed is an incentive to equip their aircraft with safety equipment if they make that determination.

Fourth, our final comment on TCAS would be that it should function outside of ground surveillance coverage when it is interrogated by airborne equipment that has interrogating ability. In other words, there is the necessity as a result of limited coverage of radar in the United States to have equipment in air carrier aircraft that would interrogate general aviation and other air carrier aircraft as to their presence and position.

Mr. DUNN. It does have that capability.

Mr. WARNER. Yes, it does, and we feel that is important.

To change lanes quickly and discuss the situation in Los Angeles. Los Angeles is certainly different from an aviation standpoint than some remote area in the Midwest. It has been, it is now, and it always will be.

One thing that is very important in our control system is that it is standardized and that those people who live in more remote areas or in higher population areas can plan, in their flying nationwide, to have a standardized system. One of the things that has been brought to us in an evolving air traffic control system, however, is over complexity. Oftentimes that is in the name—and only in the name—of safety. We believe that that has artificially created a reliance by pilots on both the system in general and controllers specifically and oftentimes that has been not in the direction of safety.

The recent illegal strike by PATCO disrupted this evolving system complexity and over control. FAA management is now taking a serious look at providing less control. I would like to emphasize—not less safety—but less control. The operation of the system over the last 4 weeks has proven to many of us that the Government has indeed been wasting considerable and important resources with unnecessary staffing in many places, money that could be better spent for safety reasons elsewhere.

Mr. Goldwater commented earlier that he does not particularly want to see the system, when it is being rebuilt, rebuilt the same way it was before. AOPA would certainly agree with that.

We recognize improvement of safety in the Los Angeles area is a complicated matter. It covers many local, geographical jurisdictions. It involves the intermingling and tradeoff of areas of concern, including noise, pollution, available runways, geography, topography, "navaids," meteorology, and sociological pressures. However, these needs must be prioritized into the area's and the Nation's aviation needs.

AOPA, as a matter of record, has submitted to this subcommittee and other committees of Congress, as well as FAA, our recommendations on what we would like air traffic control systems in the future to be. Those items are a part of my prepared statement and I will not go into detail at this time.

Our primary concern in the Los Angeles area, as well as anywhere in the United States, is for aviation safety. But we feel that is being adequately accommodated here. Behind that is our concern for the airports that are being incapacitated by restrictions, curfews, and other inappropriate local regulations.

Last year, the FAA Administrator contracted with the Air Traffic Control Association to study the situation of VFR operations in terminal areas. The study was to be an unbiased look by someone

other than the trade organizations. While there are items in the final report with which AOPA would take exception, we recommend it to the subcommittee's reading. The report outlines many problems and provides numerous ideas toward solutions, and it is quite relevant to the Los Angeles basin environment.

I would like to briefly comment on not the effect of the recent controllers' strike nor the service available, though I would be happy to comment on those. I think my comments might be best restricted to the question of safety. AOPA believes that the system is operating very well from a safety standpoint in the last 4 weeks. The indications from our members, as well as our own flying on the AOPA staff, indicates there is an all-time high of cooperation going on in the system and pilots are now more than ever recognizing some of the responsibility that they have had taken away from them by the system or think they have had taken away from them by the system.

I would also point out that FAA has asked again for an independent study of the safety of the system by the Flight Safety Foundation and AOPA will be participating in that effort through the end of this year. We will also be making comments to the National Transportation Safety Board in their independent look at safety under the current air traffic situation.

I appreciate the opportunity to be here and discuss the important work of the subcommittee and would welcome an opportunity to comment on any questions you may have now or the subcommittee may have later.

[The prepared statement of Mr. Warner follows:]

AIRCRAFT OWNERS AND PILOTS ASSOCIATION
P.O. Box 5800, Washington, D.C. 20014 / TEL: (301) 654-0500 / TELEX 89-3468

STATEMENT OF ROBERT T. WARNER, VICE PRESIDENT

AIRCRAFT OWNERS AND PILOTS ASSOCIATION

Regarding the FAA Aircraft Collision Avoidance Programs

and Air Traffic Control in the Los Angeles Area

U.S. HOUSE OF REPRESENTATIVES

COMMITTEE ON SCIENCE AND TECHNOLOGY

SUBCOMMITTEE ON TRANSPORTATION, AVIATION AND MATERIALS

HONORABLE DON FUQUA, CHAIRMAN

WEDNESDAY, SEPTEMBER 2, 1981

Mr. Chairman, I am Robert T. Warner, Vice President for ATC, Airports and Airspace of the Aircraft Owners and Pilots Association. AOPA currently represents more than a quarter of a million pilot members throughout all 50 states. We are the world's largest aviation organization. Of particular interest here is the fact that over 16% of our members reside in California.

In addition to their personal piloting activities, our members use the commercial airlines extensively as passengers and in that regard, constitute a significant portion of the total number of passengers carried by the airlines. Recent NTSB statistics also estimate that general aviation carries as many people intercity as the air carriers in a year's time. For these reasons, our members have a vital interest in collision avoidance as consumers of both types of air travel.

AOPA'S INVOLVEMENT IN CAS

In terms of both total number and total fatalities, in-flight collisions are not a large problem in general aviation. However, we in aviation are confronted with public outcries surrounding midair collisions involving air carriers. Because of this, all of us have to be concerned with the in-flight collision problem. We feel that this problem is responsive to research and development. While statistically

the numbers involved in this type of collision are insignificant, AOPA recognizes the need for all of us to be responsive. Thus our interest in these hearings and the FAA programs on aircraft separation assurance over the years.

AOPA as an organization has participated in development of collision avoidance devices and aircraft separation assurance programs for many years. We were in attendance at the Apple Valley conference in 1976, for example. In January of 1977, various general aviation groups reached agreement on a "Core" document entitled, "Policy on Collision Avoidance and Separation Assurance." This "Core" document responded to the request for comments on the FAA's separation assurance program as presented in an FAA conference the previous September. AOPA's policy statement which included this "Core" paper was transmitted to the FAA Administrator in early 1977. The series of meetings that resulted in this "Core" paper involved general aviation groups as well as representatives from airlines and airline pilots. The objective of this "Core" paper was to arrive at a unified position for general aviation and the aviation community.

FAA'S TCAS PROGRAM

Now it is 1981. We have a new FAA Administrator with new ideas. Administrator Helms calls the idea "Threat Alert and Collision Avoidance System" (TCAS).

TCAS is not exactly a new program. It builds upon years of previous DABS and BCAS work, while providing some additional services that the BCAS program would not have.

TCAS I provides services to general aviation which otherwise would not have been available under the BCAS concept. General aviation, when they purchase TCAS I equipment that is expected to cost $2500 (1980 dollars), will be provided with proximity information on ATCRBS Mode A and C aircraft in ground system coverage or when those target aircraft are being interrogated by TCAS II equipment. In addition, TCAS I equipped aircraft will receive range, bearing information, altitude differential, and maneuver intent from TCAS II equipped aircraft. Both of these capabilities are above and beyond what general aviation could have expected from the BCAS program. We have been assured in very strong terms that the initial implementation of the TCAS program will be done on a voluntary basis. It appears that Mr. Helms believes, as we do, that if a new system provides bona fide benefits to general aviation, that they will buy the equipment and implement it in great numbers without requiring rule making efforts to force implementation.

As with the BCAS program, those aircraft equipped with ATCRBS Mode C transponders can expect a measure of protection from a large population of aircraft. That is, not only from TCAS II, but now even from other general aviation aircraft with TCAS I equipment under specific conditions.

At this point, a summary of AOPA's position on the TCAS might be useful:

1. Insofar as the TCAS concept shows promise of providing protection from air carrier aircraft as well as proximity information to large numbers of general aviation aircraft, its development should be continued. We will keep a sharp eye on the cost figures.

2. In spite of the apparent long-term advantages of the TCAS concept, no effort should be made to introduce it into the system until complete and thorough service testing has been accomplished.

3. Implementation of any collision avoidance system should not be justification for lowering the floor of positive control areas, increasing the size of TCAs, or increasing mandatory carriage of transponders.

4. To assure the voluntary aspects of the program, as presented by the FAA at its introduction, no general aviation aircraft should be required to carry equipment for operation in the ATC system other than that already required.

5. Further development and implementation of Mode S should not obsolete ATCRBS except on a reasonable basis.

6. The selected airborne collision avoidance system must have the minimum ability to function outside the ground system when interrogated by other airborne systems having interrogating capabilities.

7. At selected uncontrolled airports, a simple ground-based device, capable of eliciting ATCRBS Mode A and C squitters for providing proximity information to TCAS I equipped aircraft, should be explored.

LOS ANGELES AIR TRAFFIC ENVIRONMENT

AOPA's thoughts on the air traffic control environment in Los Angeles are, to a large extent, a miniature of our thoughts on the entire air traffic control system.

While Los Angeles is certainly different, from an aviation standpoint, from a remote area in the Midwest, this area is a part of the national system. For safety reasons, we do and must continue to keep that system standardized. One thing that the evolving ATC system has resulted in is over complexity - oftentimes only in the name of safety. This has artificially created a reliance by pilots on controllers and the system. AOPA believes in many cases this has been away - not toward - improved safety.

We recognize that the improvement of safety in the Los Angeles area is a complicated matter. It covers many local, geographical jurisdictions. It involves the intermingling and trade-off of areas of concern including noise pollution, available runways, geography, topography, navaids, meteorology, and socialogical pressures. However, these needs must be prioritized into the area's and the nation's aviation needs.

AOPA believes the present air traffic system - existing and planned - is overbuilt in complexity and underbuilt in capacity. It will not meet all of the varied aviation needs of our great country. The future air traffic system must accommodate general aviation and all other air traffic.

The recent illegal strike by PATCO has disrupted this evolving system complexity and "over-control." The FAA Management is now giving serious thought to providing less control. The operation of the system for the last four weeks has proven to us all that the government has been wasting considerable resources for unnecessary staffing.

The air traffic system is more than "control." It includes flight information (charts and the dissemination of weather information and other critical data), airports and navigation. The FAA answer for all problems is automation and more control. Automate the FSS system. Whenever in doubt about the ATC system, create more controlled airspace and provide more automation.

This type of limited thinking will not work. We cannot afford the costs of the labor-intensive system now - let alone an expansion of it. Automation alone is not the answer.

The factor that must be recognized by the policymakers is that aviation cannot be totally accident-free. The FAA Act is clear on the two levels of safety which do and should exist in the system. The Act requires the highest level of safety for air carriers and reasonable air safety for others. AOPA translates this to mean control only in those areas where justified by traffic volume and wherever a genuine need exists for the services. Some aircraft, by virtue of their operating characteristics and the service in which they are engaged (meaning airline jets), require special measures to protect them and to protect other aircraft from them. They must be limited to certain areas and airports where that extra protection can be afforded. The extension of restrictions and the placing of burdens on other users of the airspace to solve very small risks should be avoided.

The overly complex current ATC system with its complicated FARs and confusing procedures, coupled with the FAA's future program for aircraft separation, will not satisfy most general aviation needs in the future. AOPA has suggested the development of a system that will accommodate all

aviation, with a more realistic placement of burdens. This will mean placing more of the burden on the certificated air carriers that are making sophisticated demands on the system, and designing improvements that will permit other aircraft to operate with reasonable safety, utility and without undue burden.

A review of AOPA's earlier recommendations to FAA and the Congress are equally applicable to the Los Angeles area. These recommendations may need future review, if TCAS becomes a reality. However, the following should be considered:

1. Reduce the number of control towers and the hours of operation, wherever possible.

2. Eliminate the confusion of Stage I, II and III radar service and replace with radar advisories on request.

3. Retain all existing TCA configurations except ATL and SAN. Establish the ATL and SAN tops at 7,000' MSL. Modify airline turbojet arrival routes and build corridors to provide protection. Depict these corridors on visual charts at locations meeting current TCA candidate criteria (.25% national enplaned passengers). Require two-way communications as in airport traffic area.

4. Require squawk or talk above the existing TCAs to 12,500' MSL within the lateral boundaries.

5. Require squawk and talk above 12,500' MSL. Pilots must call - controllers cannot deny access.

6. Foster the development of NASA's Automated Pilot Advisory Service.

7. Airline turbojet aircraft should be required to operate above 12,500' MSL enroute, with few specialized exceptions.

8. Impose the present 250 knot speed limit up to 12,500' except in TCAs and charted corridors.

9. Special attention must be given to the requirements of sailplane, balloon and parachute activities above 12,500'. Further, the near-term recommendations dealing with operations above 12,500' are not germane to the airspace in Alaska, Hawaii or elsewhere that is not covered by positive control area above 18,000'.

Our primary concern in the Basin Area is not safety so much as a need to accommodate the existing and future aviation demand with airports that are not incapacitated by restrictions, curfews and inappropriate regulations. The development and use of voluntary VFR routes is a good

avenue to pursue. AOPA recommended to the FAA that radar traffic flow studies be conducted at all existing and proposed TCA locations immediately after the FAA unveiled the emotionally-motivated and implemented TCA in San Diego. AOPA is not against reasonable regulation and requirements for pilot qualification and equipment installation. But the government has a history of overstepping and moving into many areas not needed and frequently into areas of economics instead of safety.

Late last year, the FAA Administrator contracted with the Air Traffic Control Association to study the situation of VFR operations in terminal areas. The study was to be an unbiased look by someone other than the "trade organizations." While there are items in the final report with which AOPA would take exception, we recommend it to the Subcommittee's reading. The report outlines many problems and provides numerous ideas towards solutions, and it is quite relevant to the Los Angeles Basin environment.

AOPA welcomes the opportunity to provide some thoughts on this Subcommittee's important work. We would be happy to respond to any specific questions the Subcommittee might have.

Mr. GLICKMAN. Let me ask two questions. I gather from the testimony of AOPA that you are generally supportive of the Administrator's moves in the TCAS area?

Mr. HOWELL. Yes, sir.

Mr. GLICKMAN. You differ from the previous testimony of the Air Transport Association, who would like to move ahead with BCAS immediately. You think the direction Mr. Helms is going is correct.

Mr. HOWELL. That is correct.

Mr. GLICKMAN. Mr. Warner, in summary, do you have a one- or two sentence feeling about TCAS?

Mr. WARNER. We support its development and think it is a much better buy for the dollar if it performs as promised by Administrator Helms.

Mr. GLICKMAN. That implies there should be more work on it. I think you stated in your testimony that it should not be in the air until proven, and that it should not be emotionally motivated. At what point in time does it become reasonably proven enough to move ahead? We have been proving these CAS systems for 10 or 12 years. Mr. Goldwater touched on that in his opening statement. When do we begin to implement them?

Mr. WARNER. We have been looking at those things and different CAS concepts for that period of time. However, it seems every time we have picked up a rock there has been another problem. I realize the boon of research and development is there is always something a little better a little later, but we feel that TCAS has shown it has the most promise to cover all the problem areas that have surfaced in testing. So we would not like to see any emotional or immediate implementation of TCAS—or BCAS for that matter—ahead of its time, because as was pointed out earlier, and I think important to reiterate, any type of CAS is a tool and if provided to human beings and then in some way it is mismanaged or not used properly, just as much as the ground-based conflict alert or just as much as the ground proximity warning indicators, the tool is no help. So it is only a tool for human beings to use.

Mr. GLICKMAN. My final questions would concern the voluntary equippage issue. I realize that probably with your organization as

well as with the manufacturers—following up on what Mr. Dunn talked about—there is not a great deal of excitement to mandate equippage of TCAS I or transponders in all aircraft unless they operate in the TCA area. I gather Mr. Howell would indicate he would like to see that happen.

How would you feel about some form of phased mandated compliance over a period of years?

Mr. WARNER. Mr. Chairman, we think history—very recent history—would indicate there is not a need for even a phased mandatory requirement for this type of equipment. The reason being that most aircraft that operate in the air traffic control system, virtually all general aviation aircraft that operate IFR at any time during the year have a transponder.

Mr. DUNN. That is double talk. Most every general aviation aircraft that operate IFR some time during the year do have a transponder.

Mr. WARNER. That is correct.

Mr. DUNN. The question is should all general aviation have a transponder? That is not the same question.

Mr. WARNER. I realize that. I am still going. The comment was also made earlier by Mr. Hardaker about equipping general aviation aircraft that are newly introduced to the fleet that are coming out the factory door in Wichita. I think history will also indicate those aircraft are equipped specifically, too. Should all aircraft be required to be equipped? I would suggest that when the gentleman that has a crop duster sitting at the airport in Timberlake, S. Dak., gets ready to replace it and buy a new airplane from Wichita that there still will be no need for him to have a transponder since he never gets above 30' feet and has never been more than 300 miles away from Timberlake.

Mr. DUNN. How did the aircraft get from Timberlake to Wichita? At 300 feet?

Mr. GLICKMAN. On a C5A.

Mr. WARNER. The main point I would like to make is that we feel people are equipping with transponders and transponders and encoders to better utilize their aircraft. If they have the necessity to be in airspace which already requires them to have that equipment, they will have that equipment by regulation that is already in place. And TCAS as envisioned will play against and protect air carrier passengers and air carrier pilots from those airplanes that have that equipment and are operating in that airspace. We prefer to turn that statement around and say we are protected from them, but the end result is the same. We do not think it is necessary, nor will it be necessary to have mandatory equippage. That speaks to transponders.

Let me speak specifically to whether there should be implementation requirements for TCAS. AOPA believes there should not be. If the equipment is proven to be valuable then people will voluntarily—those people who have a need to, those people who are operating their aircraft in airspace where that is important to them, will voluntarily equip with that "safety equipment." They will be making an individual decision that that is safety equipment. If Mr. Dunn feels uncomfortable in flying from Lansing to Washington, D.C., when he is just outside of Washington TCA

because of the traffic that is trying to remain clear of the TCA, then he might feel it appropriate to buy a TCAS I. We would like him to be able to make that decision.

Mr. GLICKMAN. Mr. Goldwater.

Mr. GOLDWATER. Thank you, Mr. Chairman.

You gentlemen represent pilots that fly passengers on commercial airlines. Yet many of your pilots are general aviation pilots also. Do you get concerned as airline pilots with congestion in and around a TCA and does that present an accident that is waiting to happen?

Mr. HOWELL. Yes. There are concerns about the high density of traffic around TCA's, because there are some airports that we serve that are in these areas. They are adjacent to a major hub and they therefore lie outside of the TCA yet in the area of high-density aircraft. So we are concerned about that.

The transponder would go a long way toward helping alleviate some of those concerns.

Mr. GOLDWATER. The point was made that from the standpoint of commercial airlines operating within the TCA, the greatest accident potential occurs as you transition out of or into the TCA. I wonder if you would concur with that? Have you had any personal experience or know of any experience of your pilots who have had near misses which you could relate to the committee?

Mr. LAHR. A lot of us don't even carry the TCA chart in the cockpit. We rely on the system to keep us within the TCA. I am just as glad that chart is not in the cockpit. It is so complex that if I had to refer to that chart every time I came into a terminal area, I would spend all my time trying to memorize all the section boundaries. We don't even use it. We rely on the system. We have a general idea of where the boundaries are.

Speaking specifically to your question, we do have a problem area here along the coastline above the top of the TCA. This space is allotted to general aviation. Often they will be flying just over the top, up and down the coastline. We will be coming down from San Francisco and transitioning into the TCA at Santa Monica, so there is potential conflict. We have had some near misses there. I had one myself there at night about 1½ years ago.

Mr. GOLDWATER. Would you relate the incident?

Mr. LAHR. It was that situation. I was coming from San Francisco and just approaching Santa Monica VOR just north of Los Angeles Airport. I was eastbound and there was a light aircraft coming from the northeast toward Santa Monica at my same altitude. As you know, it is difficult to pick up targets at night that are not brightly lit against the background of city lights. Fortunately, we did see this other aircraft, and so we descended 300 or 400 feet earlier than we would have and passed underneath him. We asked ATC if they had the target, and they did not, so it could have been a light aircraft with a poor radar return and without a transponder. But it points up the need for an airborne collision avoidance system to back up the ground system, because there are many times they don't see the targets to call out to us.

Mr. GOLDWATER. Do you feel there has been a problem with the new Administrator making this swift decision to move from BCAS to TCAS without consultation with the industry and users and

manufacturers, or do you feel there has been enough discussion about this?

Mr. WARNER. If I might answer. Mr. Goldwater, I think we would like to be consulted on such matters, but I think your second alternative was indeed the case this time, that the subject had been discussed enough. The new Administrator had the knowledge of what was necessary. He also, I might suggest, has a concern for general aviation that perhaps earlier administrators did not as to our needs, safetywise and economically. We think TCAS was a big step in recognition of that particular part of the need. So we have no particular problems. We are not highly insulted that we were not consulted prior to the decision.

Mr. HOWELL. It would seem to us here we are at the silver anniversary of the Grand Canyon midair collision, and we have had more than enough time to look at the options available. There have been significant technological innovations to give us a concept that is ready for installation. I think this Administrator brought to the problem an operational background or flavor to his thinking that was most welcome. For that reason we applaud what he did.

Mr. GOLDWATER. It has been 25 years since the Grand Canyon accident?

Mr. HOWELL. Yes, sir.

Mr. GLICKMAN. Mr. Dunn.

Mr. DUNN. Several groups have testified they were upset because they were not involved in the TCAS decision. That attitude is also on this committee. We fund research for FAA and we did not have any advance notice of it either, so I had this same initial reaction. After looking at it, I would agree with Mr. Warner here that the benefit far outweighs the fact that we were not consulted previously, but I understand your position.

Mr. GLICKMAN. I want to thank you all for your testimony today. It was very valuable.

Mr. GLICKMAN. Next is Mr. Domenic Torchia, vice president, Western Region, Professional Air Traffic Controllers Organization.

STATEMENT OF DOMENIC TORCHIA, VICE PRESIDENT, WESTERN REGION, PROFESSIONAL AIR TRAFFIC CONTROLLERS ORGANIZATION

Mr. TORCHIA. I would like to request that my statement be entered in the record.

Mr. GLICKMAN. It will be entered in its entirety.

Mr. TORCHIA. That material is from the PATCO Research Department. That is information on BCAS, ACAS, ATARS.

Mr. GLICKMAN. We will include these in the committee files. Go ahead and proceed and introduce the people who are with you.

Mr. TORCHIA. To my left is Dave Evans, facility representative, PATCO 502 at Los Angeles Air Traffic Control Center. To my right, Jim Pettus, air traffic controller and facility representative at Los Angeles TRACON. And directly behind me is Chuck Sheehan. He is PATCO facility representative at Los Angeles tower.

In the interest of brevity, I would like to submit my entire testimony for the record and make some observations and statements and then answer any questions you might have regarding traffic configurations.

First, PATCO is not surprised that FAA did not ask us for any input on any system because they never have and we are used to it. I have some questions I would like entered in the record that maybe the agency can answer or some of the groups. Since it appears all the hardware has not been designed, and therefore not tested, it calls into question how the FAA can be so precise as to the cost estimates they have on this equipment. Can these claims about benefits of TCAS be factual and not just wishful thinking?

The third question is, we have collision avoidance systems on many radar systems throughout the country that work rather well. A lot of false alarms but they do work well. Does FAA intend to spend more taxpayers' money on ATARS, BCAS, TCAS, and down the alphabet? Whatever they have spent money on so far, the results are obviously zero. The best way to avoid collisions is through human observation of traffic both in the radar rooms, in towers, and specifically in the cockpits of airplanes. There is no better system designed, nor do we feel there will be any money available to design a better system than the human mind and ability to rationalize situations.

The initial concept of BCAS started about 1971 and was a result of the midair collision here in the Los Angeles area between Hughes Air West DC-9 and a military F-4. After that, Litchford Industries designed the first BCAS and tested it in New York. It was all well and good. It was kind of a novel thing at the time. That was over 10 years ago.

The fact is BCAS would not have prevented that midair collision that promulgated its very investigation. The F-4 had no transponder on this aircraft. It was not sending out a signal; it could not have been interrogated, so therefore it could not have been avoided.

The other midair collision that has brought on some screams for some change, technological advances, was the PSA 182 and Cessna 11 Gulf crash in San Diego, which I participated in the accident investigation on that. The fact is I am not sure whether TCAS, ACAS or any of the other CAS's would have prevented that accident. The flight crew said they saw the airplane. They had a lapse and hit the airplane anyhow. That may have been the one though that BCAS system could have prevented if the flight crew had not taken it as another false alarm.

The last thing I am going to address myself to is just to respond to a statement made by the gentleman from ALPA; that is, we have no record in history of a midair collision involving radar controllers in the Los Angeles basin. We have about 45 years of air traffic control experience sitting here with us. I think a lot of this testimony is very emotional and lacks really any basis of fact or any documentation as to what exists in the system. I would like Dave Evans to address the issue of the conflict alert system and how it has been working in the centers, and also Jim Pettus as to how it works in the terminals.

Mr. EVANS. The conflict alert system at the Los Angeles Air Route Traffic Control Center is somewhat handicapped by unwillingness of the FAA management at that facility to work with us on the problems. They did, 4 years ago, a readout on the high-speed

printer of how many times conflict alert went off. Ten thousand conflict alerts went off in a 24-hour period.

Mr. GLICKMAN. Conflict alerts being on your scope?

Mr. EVANS. The data blocks flash. Part of the problem with the flash is they disappear and re-present themselves. Disappear and re-present themselves. The situation gets more and more complex as you get in busier situations. You have a conflict alert list that is presented on your scope which you can move around at different areas of the scope, but sometimes it gets into two paragraphs when you have 10 or 12 aircraft in conflict. They put a listing of the two aircraft in conflict. You then have to look away from the scope, move a slew ball over to a dot that precedes the list and push the "enter" button to resolve it, to interface with the computer that you have seen the conflict, and then it will stop flashing for a period of time and then it will start flashing later. What this situation ends up being is that the fact that data is leaving your scope and coming back on creates problems.

Betty Ford, when she was campaigning for her husband, almost got hit over Burbank because of the conflict alert system. There was a late transfer of communication on a Learjet and she was almost part of a midair collision at that time. What we tried to do and the suggestion went in 4 years ago from a local facility—controller's name was Donald Baker—was to have the conflict alert not leave the scope, have the presentation always there but go to bright-dim display. It went through FAA lines, went up to I am not sure exactly what committee in Washington where they looked into the presentation to the controller but they wanted to make no change. Even though it was an improvement, they wanted to make no change.

They told us to think of the conflict alert as another controller standing over our shoulder and looking for systems errors or possible errors. Well, if he was there, I would probably slug him because he cries wolf so often and I'm so busy sometimes resolving the flashing so I can see the traffic to separate it—and VFR flashes as well as the IFR that the workload is—I am so busy doing that and not separating aircraft—a lot of times I am busy trying to see the aircraft. So the problem I see in the present system is with changes that are possible. We have even adjusted—a year ago we had PATCO ask for a study to adjust the blink rate. It would never leave. It would flutter. Some of the blink rates were very irritating. Some of them were acceptable. They scrapped that study. It is the problem when it finally gets to the field and when you have to work with it you have to have somebody that is willing to work with you and change it so it can work.

As far as our present system, has the conflict alert system helped me? Yes. One time a T-38 off of Vandenburg was climbing to 23, heading toward Edward area, PSA climbing out. It was a late handoff, error in coordination. The conflict alert blinked and the other aircraft was not on my scope yet. I found out who it was and the T-38 was stopped at 21, got higher and asked PSA for one of these great rates of climb. He punched it up to 31 and we cleared with separation, I might add. So it does help in those situations.

But on balance with the problems of crying wolf, with the problems of having all this blinking going on I am not sure it does not

cause as many errors as it prevents. Potentially we have a good system going on. When controllers get very busy around Burbank departure areas, in the area I used to work, over Ventura and northbound, what we do when we get busy is we ask for overhead. We ask for help, someone who cannot only see the problems and know the traffic but who can coordinate for us and take some of the workload off. This system is potentially good but when we get so busy we tell them to turn the conflict alert off or raise the floor to 15,000 feet because everybody going to Santa Barbara—the Herons and the Condors—you get busy and in that situation, and you have so much blinking going on, you have to have the floor raised so you can work the traffic. That is pretty much what I would like to present to you.

[The prepared statement of Mr. Torchia follows:]

TESTIMONY OF THE

PROFESSIONAL AIR TRAFFIC CONTROLLERS ORGANIZATION

BY

Domenic V. Torchia
Regional Vice President
Western Region

Before The
Honorable Dan Glickman, Chairman

Subcommittee on Transportation, Aviation and Weather
Committee on Science and Technology
House of Representatives of the United States

September 2, 1981

We would like to thank the members of the subcommittee for allowing PATCO this opportunity to testify before you today. We understand that our role in this hearing is to give the members of the subcommittee our views as to the feasibility and compatibility, in the ATC system, of various collision avoidance systems. Here with me today, to help answer your questions, are three Air Traffic Controllers who work in the Los Angeles area. From Los Angeles Center is Dave Evans; from Los Angeles Approach Control is Jim Pettus; and Chuck Sheehan, a controller at Los Angeles Tower.

It is our opinion that it would be best to answer your questions based on how the system works during normal traffic conditions rather than as it is during this period of reduced traffic. By doing this you will be better able to draw your conclusions based on the most realistic of system demands.

The most important question you are faced with deals with the necessity for any further expenditures in the area of collision avoidance. If the cost versus benefit question, as it applies to moving ahead with expenditures in research and development, is determined not to be appropriate, then there is no need for further involvement on this subject by your subcommittee and the aviation community. If you find that the benefits gained by additional collision avoidance research are greater than the costs, then by all means we should move ahead with

the necessary studies, research, and development of the most suitable system.

Assuming this subcommittee concludes that there is a need to develop a collision avoidance system, and that it can be produced at a cost that would not be prohibitive to its actual procurement by government and/or users, then the real question becomes, "What system is most effective and most compatible with the ATC system?"

If the subcommittee, and subsequently the Congress, move forward with a decision in the affirmative regarding a collision avoidance system our organization would like to go on record as supporting a system that incorporates a ground linked command system. The obvious and primary reason for this is that the greatest demand on such a system would be in or about busy terminal areas. It could present a greater problem to safety if a system depended solely on airborne information to flight crews, and those flight crews began making turns, etc. in the congested areas without prior coordination with controllers. Consider some basic reasons why an airborne system would be less cost and safety effective.

1. Flight crews would not have the complete traffic "picture."
2. With the trend in newer air carrier aircraft toward two man crews, crew workload involving a system

that required constant monitoring would increase tremendously.

3. Average cost for airborne systems is now estimated at about $3,500 per general aviation aircraft, and about $50,000 per air carrier with two systems required.

PATCO has always been deeply concerned with insuring the flying public is provided with the safest air traffic system possible. This is why we are here today, so that you may avail yourselves to our expertise in air traffic control. We would be pleased to now answer any questions you may have. Thank you for allowing us this opportunity to help.

Mr. GLICKMAN. Mr. Pettus.

Mr. PETTUS. In this Los Angeles basin the conflict alert, when it is going off, 9 times out of 10 the controller was aware of the situation before the alert actually occurred. In fact, sometimes we wondered why the alarm did not go off when it was intended to. These are false alarms in that respect and also alarms that divert controllers' attention away from other priorities of duty. As Domenic has said, the basis of air traffic control has been—and I believe will be—dependent upon the human element, whether it be just the ground controller or the pilots in the cockpit.

The conflict alert has helped in areas where you are not paying it as much attention to a certain portion of your radar scope as you should because of emergency conditions elsewhere. But our belief at Los Angeles Approach Control is that it is just another bell, another buzzer and annoying.

Mr. TORCHIA. I would like to make three recommendations to the committee as far as our observations, and I must apologize, none of us had much time to prepare for this. We have been busy with other activities.

The first recommendation I would like to make is more concentration be given to enhance reliever airports. The one thing that could have avoided the PSA crash was the ILS system that was installed at Montgomery Field after the crash. The pilot that was involved in that accident was making ILS approaches in the San Diego Lindbergh Field when in essence he should have been out in Montgomery doing that airwork and away from the jet airports. I think there is a great need by the FAA to concentrate on these reliever airports, enhancing the technology at these airports and allowing the general aviation pilot more freedom, at the same time more access to technology that makes flights safer for general aviation.

The second recommendation is the transponder system as we used to know it was the basic mach 10 transponder which can be put on aircraft for a very inexpensive price now. It is just a basic electronic piece of equipment that sends out a signal. It would enhance the radar presentation on the controller's scope, at the same time not cluttering it as much because it gives off a single slash rather than a double slash impression. It most likely could have prevented the near midair collision that Captain Lahr referred to because the controller would have then seen the beacon target on the radar.

The last one is to modify the present ATC system as it pertains to conflict alert to clean it up, talk over with the controllers working at the facilities as to what their needs are and what would be most beneficial to them and stop worrying about the people in Washington, D.C. The real work is done in the control rooms. Yet there is no real input on any of these systems that is being addressed by the people in Washington, D.C. or Los Angeles or any other place. Those are our three recommendations.

Mr. GLICKMAN. Let me ask you a couple of questions. I want to get to the specific point. The hearing today focused on the need and the desire of FAA to implement an aircraft-to-aircraft collision avoidance system. The implication of your testimony is that with an improved air traffic computer operation, one that maybe makes the changes in the conflict alerts that you are talking about and does the other things you mentioned, a collision avoidance system may not only not be needed, but also could be harmful. Is that the way you feel?

Mr. TORCHIA. It will be an extensive cost overrun. It will run probably $100,000 a unit for the air carriers and $7,000 a unit bare minimum for general aviation. I always double any figures FAA gives me as far as prices and usually I have been short. I think we are putting a tremendous burden on the taxpayers and on the air carrier operation and also the AOPA, the aircraft owners. I don't think it is necessary. I think we met the diminishing returns theory. There are not that many midair collisions. Just enhance what you have now and save everybody a lot of time and trouble.

Mr. GLICKMAN. But we are talking about an enormous projected growth in traffic. That is what worries me. I want the general aviation industry in Wichita to build 10 times as many airplanes as they have in the past and that is where the growth is going to occur. It looks to me as if something has to give, either in terms of the computer system itself or collision avoidance systems. I agree with you that the computers desperately need to be replaced and modernized. I also agree that you have not been given the kinds of input you should have had in that process, but it looks like we need some sort of safety valve and that is a collision avoidance system.

Mr. EVANS. I don't think we have an argument with the fact we want the pilots to have as much information to prevent hitting another pilot as can be made available to them. But I think we are back to what Mr. Dunn sees now and whatever one will see, is who are you going to listen to? Are you going to listen to a flight director that maybe gives you an indication you should turn one way to avoid hitting an aircraft or are you going to listen to a

controller who—not because he is any smarter but because they have the benefit of seeing where the traffic is—gives someone a turn.

I take issue with the 30 seconds I heard before. There are many times I have given immediate descent to aircraft because of whatever the situation was going on, where I had to get somebody down, and the response was immediate and we are talking 4 to 5 seconds to make a safe situation.

I think, my personal view is a properly staffed air traffic control sector with some, maybe, cleaned up procedures at departure corridors that no one can fly in and survival areas that are free from errant aircraft is the best system, projections or not.

Mr. DUNN. One detailed question. If we go ahead with TCAS, is it your opinion that ground controllers have to have the same information at the same time that the other airplane have it? Is that what you are saying?

Mr. EVANS. It is even more than that. You get to the situation where someone on the localizer gives a heading of 220 to join and then it is up for debate whether he is going to continue. The integrity of the system is based on these pilots flying as they were instructed to do as far as a safe, orderly arrival procedure. If you have someone taking options on going other places, you don't have control anymore. You just have "L.A. is open, come on over."

Mr. DUNN. Which is the question I raised before.

Mr. TORCHIA. And I think valid. I think some basic system should be researched. When you get into the technology they are talking about, I think it is a pipe dream. I think it is impossible to incorporate into the system something to alert the flight crews that there are aircraft intruding without giving them directions and all that sophistication we are talking about today, that has not been developed yet. I think we are wasting a lot of money and time.

Mr. GLICKMAN. I can't help but ask this final question because there has been testimony given earlier today about the safety of the ATC system during the last 4 weeks, and I think you ought to have an opportunity to give your views on the safety of the system. So I give you this opportunity now.

Mr. TORCHIA. I appreciate your consideration in this aspect. However, I decline any comment on it.

Mr. GLICKMAN. Is that the position of all of you?

Mr. EVANS. Yes, sir.

Mr. PETTUS. Yes, sir.

Mr. GOLDWATER. Do you observe the aircraft patterns in and around the Los Angeles basin and specifically as it applies to the terminal control area? Do you see an accident waiting to happen in and around the TCA? And do you feel the FAA is doing enough to alleviate that possibility?

Mr. PETTUS. Yes, I do see a problem. Every day potential under normal circumstances is there. We have numerous accounts from air carrier pilots and private pilots. On numerous occasions the air traffic controllers have requested expansions of the TCA climb and descent corridors enforcement of the TCA's whereas the pilot is required to have certain equipment and two-way communications, but nothing has ever been followed up on.

Mr. GOLDWATER. Do you find general aviation pilots busting that system, turning their transponders off and pushing through?

Mr. PETTUS. On a daily basis. And we have gone so far as to track these aircraft down to their landing, to their destination, and have the pilot report in to our facility by telephone. And as far as I know, it is dropped. They do not enforce TCA's as they are now.

Mr. GOLDWATER. Often when I have an opportunity to fly around Los Angeles, I request surveillance assistance from air traffic control only to be turned down because you are too busy. Is that an exception to procedures or is that generally true? Is the air traffic control system so clobbered up with controlled aircraft that they are unable to provide assistance to VFR traffic?

Mr. TORCHIA. What has worked in some places is the VFR sector where a controller just handles nothing but VFR aircraft, although it becomes quite hectic—at times you don't provide any separation, you just provide traffic advisories and coordination where available with the instrument traffic. That has worked, but in the Los Angeles basin you are talking about one hell of a job. You are talking about a lot of airplanes.

Mr. GOLDWATER. How many airplanes are aloft in the Los Angeles basin at peak traffic hours? Has anybody ever taken a picture of the radar scope?

Mr. TORCHIA. We counted 350 one day. That was one sector of north arrivals. Three hundred and fifty targets on the scope, which is a 20-mile range.

Mr. PETTUS. FAA has always reacted instead of planned ahead in these problems. For years—I have been at Los Angeles since 1975 and before that at Long Beach, starting in 1970—so I know the basin well. We have complained and suggested many ideas to prevent what has happened today as far as congestion. They have not seen fit to expand the TCA to enforce the TCA or to listen to any of our ideas. We have run up against a brick wall each and every time.

Mr. TORCHIA. You have a Downey loop departure going out of L.A., 24 and 25, and goes back over LA VOR navigational aid above 10. The minute they leave 7,000 they are out of the TCA, which means north and south traffic overflies that TCA at 7,500 feet and 8,500 feet. It is a prime area for something to go wrong there.

Mr. PETTUS. That is a bad area for radar coverage because it flies over Los Angeles Airport where radar antennas are located and that encompasses the VFR corridor also. It is a blind spot. There is a period of 10 or 12 miles that Los Angeles Approach Control cannot maintain radar contact with that aircraft.

Mr. GOLDWATER. That is the Downey departure?

Mr. PETTUS. It is a loop departure.

Mr. GOLDWATER. It goes out and comes back over the airport?

Mr. TORCHIA. What I would like to point out is that abomination at the bottom that they call a San Diego TC. You talk about overkill. That is about where I relinquish my duties to AOPA. That is absolutely unnecessary. Whoever designed that should be taken out and shot. The LA one is too small and it should be increased, not maybe so much as far as lateral confines but vertical confines, a minimum of another 3,000 feet to accommodate the jets until they are eastbound en route over LA VOR.

Mr. EVANS. As well as arrivals. Arrivals go 100 miles east of Los Angeles. You get Mexican flights from the south and Chicago and Atlanta mix. They get set up depending on this flow, 10 in trail, 7 in trail. They are lined up. Once they start dropping below 10,000 feet—the area called Indian country because of all the Cherokees and the rest of the general aviation aircraft down there—they get into the Ontario area and you get into a real soup kitchen down there of smog and airplanes. And then you have the lights the captain mentioned at night.

You have to sterilize. In my view we have to go to a point—you talk about projected traffic flow—you are going to have to get some sterilized quarters for safety. If you have something along that line and you have a properly staffed sector, you are on your way for a safe system. When you have a system that has an electronic toy in the cockpit providing the pilot with the information and he may go where he wants to with regard to that flight director, I see we are setting ourselves up for a lot of lost revenue and where is the gain?

Mr. GOLDWATER. Captain Lahr gave an example of an experience he had coming down toward the Santa Monica VOR on an easterly heading to land at LAX and he had a conflict with another aircraft that the air traffic controller did not see. There was an accident at Moffett Field with two aircraft where one landed on top of another. They were under positive control.

Mr. TORCHIA. Military controllers. Military.

Mr. GOLDWATER. Would not an onboard collision device catch those kinds of errors that may or may not have been intentional?

Mr. TORCHIA. Possibly. It is simple and easy to understand maybe a boop, boop, "Somebody is around you," so the flight crew could look and see what they are going to do. An air carrier aircraft is not like a Cessna 150. It takes a lot of time to turn and a lot of time to stop. You are not going to get this type system unless you mandate it on general aviation aircraft, and I don't think that is necessary.

It is just a simple system. We have technology for that.

Mr. GOLDWATER. Like PWI?

Mr. TORCHIA. Why buy the whole record album when you just want one cut on it? You could buy a 45?

Mr. GOLDWATER. I agree with you that it is a good system. But to listen to you, you would want to extend this control across the entire United States.

Mr. TORCHIA. No.

Mr. GOLDWATER. If you don't want to, what is going to happen outside? Most aircraft accidents occur in and around airports.

Mr. TORCHIA. First the abomination in San Diego, my recommendation was climb and descent corridor. That was all you needed there. TCA would not have prevented San Diego at all. It would not have prevented that accident. You have an overkill in one spot and you have not enough attention paid to a more important spot, the L.A. area.

As far as what goes on outside, you don't need anything. I recommend in those areas that you have enough staffing to provide a controller to help general aviation pilots, that a pilot could look at a terminal chart and say LA, VFR advisory frequency is 122-9 or something. Tune that in and say, "Hey, I'm out here. I know it

is busy. Do you have time to give me advisories?" and just help VFR airplanes. Say there is one here and one there and help them scan.

Mr. TORCHIA. No mention has been given to improved cockpit visibility although that was one of the big questions in San Diego. You can put seven airplanes all about 500 feet apart within the space of the windshield wiper at so many miles. Cockpit visibility has to be analyzed here, too.

You spend billions and billions or whatever it will run up to for a system that is going to say, turn left, turn right, and you are going to turn it off. That is not very good.

Mr. GOLDWATER. Do controllers generally support an independent CAS system that you have to deal with?

Mr. TORCHIA. Only the fact that it will alert the flight crews that there is somebody around them. A lot of times flight crews don't need vigilance but just some system that would go on, with a small false alarm rate, would be very beneficial.

Mr. EVANS. We are in the position where we will take all the help we can get. If the machine works properly and helps us, fine; but it has been our experience with FAA that they throw it out there and we say we need these changes and they say, "We bought it."

Mr. GOLDWATER. You don't feel FAA is really listening to the air traffic controllers as far as refining the system they have?

Mr. EVANS. No.

Mr. GOLDWATER. I think that is probably something that this committee could be looking at as a future subject for hearings, to find out if there is good information flow back and forth. I think that is very important. What is the use of having that equipment in your control tower cab if it is not working to give you the kind of information you need?

I get concerned about the air traffic in and around Los Angeles. I understand the need for a terminal control area. But in my opinion not enough concern has been given to the pilot that is forced around the outside of the TCA across particular corridors in a funneling effect. Today maybe it can be handled, but I am concerned about the growth of traffic. I'm not sure that FAA is looking hard enough at what can be done to provide separation, to provide information, or to redesign the system so you don't get that funneling effect. I, as a general aviation pilot, do not go 1 year without some kind of near miss. I can put my hand on a Bible and say that. And I know a lot of other pilots who have had the same kind of experience. It is my opinion that FAA is probably not doing enough. I think this is a good step, but we have to continue to try to find better answers for this question.

Mr. TORCHIA. There is an obvious misconception about TCA's as being prohibited air space. They are not. They are controlled air space. I was an air traffic controller from the inception of TCA in the bay area, in which we had no input either. But when they put in the TCA in the bay area I can't recall one time in 6 years working with that TCA that I ever denied a pilot that came up and asked me for a clearance through TCA—that clearance through TCA.

There may be times. I know I have seen other controllers do it but very, very infrequently does it ever happen.

Mr. GOLDWATER. It sure happens around Los Angeles.

Mr. EVANS. For flight advisories.

Mr. GOLDWATER. Or even if you ask for clearance you get diverted to Palm Springs and back if you are going from Van Nuys to Orange County.

Mr. EVANS. I'm familiar with that.

Mr. GOLDWATER. You can drive from here to Newport Beach in rush hour and beat an airplane that normally takes 15 minutes to fly the route (before there was a TCA).

Mr. PETTUS. There are a lot of problems that we as controllers encounter, not only the number of aircraft but the routes that are involved. We have other problems that compound the problem of getting you from point A to point B directly, such as communications problems. Our transmitters are of low output and if you have too many aircraft on your frequency you get stepped on and you can't give realistic or timely control instructions. So therefore, not because there are too many airplanes in one particular place, but because you have too many airplanes on your frequency and you cannot give timely control instructions to the IFR aircraft you have to deny certain service in order to make it safe for the majority.

Mr. DUNN. I don't have any questions.

Mr. GLICKMAN. Thank you. Thank you for testifying. Our last witness is not going to be able to appear today so this will conclude the hearing. The testimony of Michael D. Antonovich, supervisor, fifth district, County of Los Angeles, will be included in the record.

[The prepared statement of Mr. Antonovich follows:]

STATEMENT

OF

MICHAEL ANTONOVICH

MEMBER

LOS ANGELES COUNTY BOARD OF SUPERVISORS

ON

AIRCRAFT COLLISION AVOIDANCE SYSTEMS AND AIR TRAFFIC SAFETY IN THE LOS ANGELES BASIN

BEFORE THE

HOUSE SCIENCE AND TECHNOLOGY COMMITTEE

SUBCOMMITTEE ON TRANSPORTATION, AVIATION AND MATERIALS

SEPTEMBER 2, 1981

MR. CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE, I AM MICHAEL ANTONOVICH, MEMBER OF THE LOS ANGELES COUNTY BOARD OF SUPERVISORS. THANK YOU FOR THE OPPORTUNITY ON BEHALF OF MY COLLEAGUES AND MYSELF ON THE BOARD TO REPRESENT THE COUNTY OF LOS ANGELES HERE TODAY. I ESPECIALLY APPRECIATE THIS OPPORTUNITY SINCE I REPRESENT, AMONG OTHER AREAS, THE NORTHERN SAN FERNANDO VALLEY AREA.

MANY TECHNICAL ISSUES OF THE THREAT ALERT AND COLLISION AVOIDANCE SYSTEM OR TCAS HAVE BEEN ADDRESSED HERE TODAY.

WE ARE ESPECIALLY CONCERNED WITH THE PLANS OF THE F.A.A. FOR APPLYING COLLISION AVOIDANCE TO GENERAL AVIATION AND THE CORRESPONDING COST OF ON-BOARD EQUIPMENT TO EXERCISE THOSE COLLISION AVOIDANCE OPTIONS.

WE ARE SEARCHING FOR A BETTER MARGIN OF SAFETY FOR THE

BEST COPY AVAILABLE

AIR TRAFFIC OPERATIONS IN AND OVER THE LOS ANGELES AREA.

THIS IS ESPECIALLY TRUE IN THE AREA AROUND BURBANK/ GLENDALE/PASADENA AIRPORT. TO THE WEST OF BURBANK IS VAN NUYS AIRPORT; TO THE NORTHWEST IS WHITEMAN, A COUNTY AIRPORT; FARTHER TO THE NORTHWEST IS SAN FERNANDO, A PRIVATE AIRPORT.

THE AIR TRAFFIC CONGESTION IN THE VICINITY OF THESE FOUR AIRPORTS IS TREMENDOUS.

AT THESE FOUR AIRPORTS WE HAVE 978,000, ALMOST ONE MILLION TAKEOFFS AND LANDINGS EACH YEAR MORE THAN ONE-FOURTH OF THE COUNTY'S TOTAL ANNUAL AIR TRAFFIC IN A COMPRESSED TRIANGULAR AREA WITH LEGS OF ABOUT SIX NAUTICAL MILES EACH.

THE SYSTEM PROPOSED BY THE F.A.A. MAY HAVE SOME EFFECT ON

BEST COPY AVAILABLE

IMPROVING THE FLOW AND SAFETY OF AIR TRAFFIC MOVING IN THIS AREA.

I HAVE SOME CONCERNS THAT THE VOLUME OF AIR TRAFFIC MAY OVERLOAD THE CAPACITY OF THE SYSTEM. HOWEVER, I'M CONCERNED ABOUT THE TIME SCHEDULE FOR THE SYSTEM WHICH INDICATES A DELAY OF TWO YEARS.

IN THE MEANTIME, SOMETHING MUST BE DONE TO DEAL WITH THIS AIR TRAFFIC. THERE ARE SOME IDEAS AND OPTIONS THAT SHOULD BE CONSIDERED FOR IMMEDIATE IMPLEMENTATION. IT IS MY UNDERSTANDING THAT A MANDATORY COMMUNICATIONS AREA (MICA) HAS BEEN PROPOSED BY THE FACILITY CHIEF AND STAFF OF THE BURBANK FACILITY AND IS UNDER REVIEW BY THE F.A.A. WASHINGTON OFFICE.

BEST COPY AVAILABLE

ANOTHER INTERIM MEASURE WOULD BE TO REQUIRE ALL AIRCRAFT, INCLUDING GENERAL AVIATION AIRCRAFT, TO BE EQUIPPED WITH TRANSPONDERS, ENCODING ALTIMETERS AND STROBE LIGHTS.

IN ORDER TO MAKE IT MANDATORY AND GAIN THE SUPPORT OF GENERAL AVIATION, THE COST TO PURCHASE AND INSTALL THESE COMMUNICATIONS AND COLLISION AVOIDANCE AIDS SHOULD BE OFFSET BY A GRANT OR SUBSIDY FROM THE USER FEES PAID INTO THE AVIATION TRUST FUND.

ANOTHER EFFECTIVE MEASURE WOULD BE THE INSTALLATION OF AN AIR TRAFFIC CONTROL TOWER AT WHITEMAN AIRPORT BECAUSE OF THE CLOSE PROXIMITY OF BURBANK AND WHITEMAN AIRPORT TO EACH OTHER.

COUNTYWIDE WE HAVE 18 PUBLIC AND PRIVATE AIRPORTS WITH

BEST COPY AVAILABLE

TOTAL TAKEOFFS AND LANDINGS OF ALMOST FOUR MILLION ANNUALLY

. . . THERE ARE 5,239 AIRPLANES BASED AT THESE AIRPORTS.

FOR YOUR INFORMATION, HERE IS A LISTING OF THE 18 AIRPORTS IN THE COUNTY WITH TAKEOFF AND LANDING STATISITICS FOR THE 1980 YEAR - THE LATEST AVAILABLE DATA.

LONG BEACH (CITY) 606,331

VAN NUYS (CITY OF L.A.) 540,560

LAX (CITY OF L.A.) 523, 961

TORRANCE (CITY) 346,158

EL MONTE (COUNTY) 211,044

SANTA MONICA (CITY) 210,171

BRACKETT (COUNTY) 194,761

HAWTHORNE (CITY) 171,885

BURBANK (AUTHORITY) 264,429

BEST COPY AVAILABLE

WHITEMAN (COUNTY) 144,900

COMPTON (COUNTY) 144,000

FOX FIELD (COUNTY) 134,680

PALMDALE (CITY OF L.A.) 90,838

AGUA DULCE (PRIVATE) 34,200

SAN FERNANDO (PRIVATE) 27,900

HUGHES (PRIVATE) 2,700

CRYSTAL AIR (PRIVATE) 2,250

QUARTZ HILL (PRIVATE) 2,250

WITH THIS HORRENDOUSLY HEAVY AIR TRAFFIC - ESPECIALLY WITHIN THE LOS ANGELES BASIN - A SERIOUS QUESTION ARISES IN MY MIND.

THAT QUESTION IS:

BEST COPY AVAILABLE

HOW EFFECTIVE CAN THE F.A.A. BE IN IMPLEMENTING AND OPERATING A THREAT ALERT COLLISION AVOIDANCE SYSTEM IN THE CONGESTED AIRSPACE OF THE LOS ANGELES BASIN AND MAKE THE KEY DECISIONS AND ADJUSTMENTS NECESSARY TO START UP AND RUN A PROGRAM FROM A REGIONAL OFFICE MORE THAN 1,000 MILES AWAY FROM THE SITE OF THE ACTION?

TO RELOCATE THE WESTERN REGIONAL OFFICE OF THE F.A.A. TO SEATTLE - ALONG WITH THE ROCKY MOUNTAIN AND THE HONOLULU OFFICE AT THIS POINT IN TIME, DOES NOT MAKE SENSE.

THE MAJORITY OF AIR TRAFFIC, AIRPORT AND AVIATION ACTIVITY IS TAKING PLACE IN THE LOS ANGELES BASIN AND THE SOUTHWESTERN UNITED STATES.

KEY DECISIONS AT THE REGIONAL OFFICE LEVEL MUST BE MADE

BEST COPY AVAILABLE

ON A WEEKLY, AND IN SOME CASES, A DAILY BASIS.

TO REMOVE THE PEOPLE WHO MAKE THESE DECISIONS 1,000 MILES AWAY FROM THE SITE OF THE ACTIVITY SIMPLY DELAYS THE DECISIONS, AND IN SOME CASES THIS DELAY MAY BE A SERIOUS DETRIMENT TO THE SAFE OPERATING CONDITIONS OF AIR TRAFFIC WITHIN THE LOS ANGELES BASIN.

ANOTHER ASPECT OF THIS RELOCATION IS THE ECONOMICS.

THE FEDERAL AVIATION ADMINISTRATION STATES THAT THEY WILL SAVE TWENTY-TWO MILLION DOLLARS ANNUALLY IN THE CONSOLIDATION AND RELOCATION OF REGIONAL OFFICES.

THIS SAVINGS MAY BE REAL TO THE FEDERAL GOVERNMENT, HOWEVER, IT WILL BE AT THE EXPENSE OF LOCAL GOVERNMENTS WHO ARE THE PROPRIETORS OF THE AIRPORTS IN THE NATIONAL AIR TRANSPORTATION

BEST COPY AVAILABLE

PLAN.

CONSIDER ALL OF THE PROPRIETORS WHO OWN AND OPERATE AIRPORTS THROUGHOUT THE SOUTHWESTERN UNITED STATES IN CALIFORNIA, ARIZONA, NEVADA AND UTAH, WHO WILL HAVE TO COMMUNICATE OR TRAVEL TO SEATTLE. THIS WILL ADD CONSIDERABLE EXPENSE TO THE LOCAL AGENCIES' AND PROPRIETORS' COST OF OPERATING THEIR AIRPORTS.

LOS ANGELES IS THE NATIONS WESTERN TRANSPORTATION HUB;

IT IS FAR EASIER FOR MOST ADMINISTRATORS AND REPRESENTATIVES OF AIRPORT PROPRIETORS TO TRAVEL FROM THEIR CITY OR COMMUNITY TO LOS ANGELES THAN IT IS FOR THEM TO TRAVEL TO SEATTLE.

TO TRAVEL TO SEATTLE, AIR FARES WILL BE GREATER AND TIME DELAYS WILL BE LONGER, ESPECIALLY IF YOU HAPPEN TO MISS A

BEST COPY AVAILABLE

FLIGHT CONNECTION. THE RESULT WILL BE THAT EXPENDITURES FOR TRAVEL TO DEAL WITH THE F.A.A. MAY DOUBLE OR TRIPLE IN TERMS OF THE AIRPORT PROPRIETOR'S EXPENSE.

IN MY RECENT TESTIMONY BEFORE THE SUBCOMMITTEE ON GOVERNMENT ACTIVITIES AND TRANSPORTATION, I STATED THAT THE PRESENT REGIONAL OFFICE HAS ADEQUATE SPACE TO HANDLE ANY NUMBER OF CONSOLIDATIONS.

CONTRARY TO THE STATED INABILITY OF THE F.A.A. TO HIRE QUALIFIED WORKERS, THEY HAVE HAD A HIRING FREEZE IN THE LOS ANGELES AREA FOR THE PAST THREE YEARS.

THE LOS ANGELES AREA PROBABLY HAS A GREATER POOL OF SKILLED AVIATION/AIR TRANSPORTATION WORK FORCE THAN ANYPLACE IN THE NATION.

BEST COPY AVAILABLE

THE FEDERAL AVIATION ADMINISTRATION REGIONAL OFFICE LOCATED IN THE LOS ANGELES AREA IS RESPONSIBLE FOR, AMONG OTHER FUNCTIONS, AIRPORTS, AIR TRAFFIC CONTROL, AIRSPACE AND FACILITIES.

TO MOVE ALL THESE KEY FUNCTIONS TO SEATTLE TO SAVE MONEY FOR THE FEDERAL GOVERNMENT AT INCREASED COST TO THE LOCAL AIRPORT PROPRIETORS, SEEMS INAPPROPRIATE. WE AGREE TO THE CONCEPT OF CONSOLIDATION TO SAVE OPERATING COSTS, HOWEVER, IF THE CONSOLIDATION IS NECESSARY IS SHOULD BE IN LOS ANGELES WHERE THE GREATEST CONCENTRATION OF AVIATION ACTIVITY IN THE WORLD IS LOCATED.

ANOTHER CONCERN THAT I HAVE IS THE CITY OF SANTA MONICA'S PROPOSAL TO CLOSE SANTA MONICA AIRPORT.

THE BURDEN PLACED ON AIR TRAFFIC AROUND OTHER AIRPORTS

BEST COPY AVAILABLE

IN THE LOS ANGELES BASIN WOULD BE CONSIDERABLE SHOULD THE 500 PLUS AIRCRAFT BASED AT SANTA MONICA AIRPORT BE DISPLACED.

EVERY EFFORT SHOULD BE MADE BY THE FEDERAL GOVERNMENT TO SEE THAT THIS VALUABLE AIRPORT FACILITY REMAINS IN THE NATIONAL AIRPORT SYSTEM.

I HAVE BEEN ADVISED RECENTLY THAT THE F.A.A. WILL CLOSE THEIR AIR TRAFFIC CONTROL TOWER AT FOX FIELD IN LANCASTER ON THE SIXTH OF SEPTEMBER.

FOX TOWER, WHILE NOT A HIGH TRAFFIC TOWER, IS A SIGNIFICANT AIR TRAFFIC SAFETY ELEMENT DURING U.S. FOREST SERVICE AIR ATTACK OPERATIONS AT FOX FIELD.

I URGE THE F.A.A. TO REACTIVATE FOX TOWER WHEN TRAINED CONTROLLERS ARE AVAILABLE.

BEST COPY AVAILABLE

IN SUMMARY, I RECOMMEND TO THIS COMMITTEE THAT THEY CONSIDER AN INTERIM SOLUTION TO THE AIR TRAFFIC PROBLEM IN THE LOS ANGELES BASIN - INCLUDING THE SAN FERNANDO VALLEY- BY URGING:

1. THE ADMINISTRATOR OF THE F.A.A. TO SPEEDILY REVIEW AND APPROVE THE PROGRAM AND PLAN FOR A MANDATORY COMMUNICATIONS AREA;

2. THAT THE COMMITTEE REVIEW AND, IF IN CONCURRENCE, RECOMMEND A PROGRAM TO FURNISH AND INSTALL TRANSPONDERS, ENCODING ALTIMETERS, STROBE LIGHT SYSTEMS AND FUTURE THREAT ALERT AND COLLISION AVOIDANCE EQUIPMENT ON ALL GENERAL AVIATION AIRCRAFT IN THE UNITED STATES TO BE SUBSIDIZED BY THE AVIATION TRUST FUND;

3. TO REVIEW WITH THE ADMINISTRATOR THE NEED FOR AN AIR TRAFFIC CONTROL TOWER AT WHITEMAN AIRPORT;

BEST COPY AVAILABLE

4. EVERY EFFORT BEING MADE TO KEEP SANTA MONICA AIRPORT OPERATIONAL;

5. AN IMMEDIATE REVIEW WITH THE F.A.A. ADMINISTRATOR AND URGING RECONSIDERATION OF RELOCATION OF THE WESTERN REGIONAL OFFICE OF THE F.A.A. TO SEATTLE, AND TO CONSIDER LOS ANGELES AS THE PROPER LOCATION FOR A REGIONAL OFFICE TO SERVE THE SOUTHWESTERN AREA STATES OF CALIFORNIA, NEVADA, UTAH AND ARIZONA.

THANK YOU FOR THIS OPPORTUNITY TO EXPRESS OUR CONCERNS.

Mr. GLICKMAN. I would like to say for the record that at least for the time being this hearing will conclude our collision avoidance hearings which the committee began in the spring. We had a hearing on March 31 and a hearing on April 3. As I said before, to some extent this precipitated the Administrator's decision. We hope that the FAA will come through with a clear, understandable, and concise set of procedures or regulations whichever way they decide to go. I also hope that the FAA does not leave the industry and users up in the air in terms of where they are going. So we will close the hearing today. I want to thank Congressman Goldwater for his cooperation in using southern California as a forum for this final part of the hearing that we started last spring. The hearing stands adjourned.

[Whereupon, at 1 p.m., the subcommittee was adjourned to reconvene subject to the call of the Chair.]

BEST COPY AVAILABLE